This document provides pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a minor, municipal permit. The discharge results from the operation of a 0.72 MGD wastewater treatment plant. This permit action consists of updating the proposed effluent limits to reflect the current Virginia Water Quality Standards (effective 6 January 2011) and updating permit language as appropriate. This discharge is located in the Upper Machodoc Creek, approximately 800 feet from the confluence of the Potomac River. As such, the effluent limitations and special conditions contained within this permit will maintain the Water Quality Standards of both Maryland (COMAR 26.08.02 et seq.) and Virginia (9VAC25-260 et seq.).

1.	Facility Name and Mailing Address:	Naval Support Facility Dahlgren Wastewater Treatment Plant 18329 Thompson Road Suite 226 Dahlgren, VA 22448-5018	SIC Codes:	4952 – Wastewater Treatment Plant 8733 – Research & Development 9711 – National Security
	Facility Location:	18329 Thompson Road Dahlgren, VA 22448-5018	County:	King George
	Facility Contact Name / Title:	Walter A. Legg, P.E. Supervisory Environmental Engineer	Telephone Number:	540-653-5071
	Facility Email Address:	Walter.Legg@navy.mil		
2.	Permit No.:	VA0021067	Expiration Date:	14 March 2016
	Other VPDES Permits:	VA0073636 – Stormwater Industrial Individual Permit VAN010041 – Nutrient General Permit		
	Other Permits:	Registration Number 40307 – Air Permit EPA Facility ID VA7170024684 – Resource Conservation and Recovery Act (RCRA) 610024 – EPA Underground Injection Control Permit		
	E2/E3/E4 Status:	Not Applicable		
3.	Owner Name:	Naval Support Activity South Potomac		
	Owner Contact / Title:	Jeffrey Bossart Installation Environmental Program Director	Telephone Number:	301-744-4705
4.	Application Complete Date:	14 September 2015		
	Permit Drafted By:	Douglas Frasier	Date Drafted:	1 December 2015
	Draft Permit Reviewed By:	Anna Westernik	Date Reviewed:	3 December 2015
	Draft Permit Reviewed By:	Alison Thompson	Date Reviewed:	21 December 2015
	Public Comment Period:	Start Date: 12 February 2016	End Date:	14 March 2016
5.	Receiving Waters Information:	See **Attachment 1** for the Flow Frequency Determination / Stream Model.		
	Receiving Stream Name:	Upper Machodoc Creek	Stream Code:	1aUMC
	Drainage Area at Outfall:	51 square miles	River Mile:	1.84
	Stream Basin:	Potomac River	Subbasin:	Potomac River
	Section:	2	Stream Class:	II
	Special Standards:	a	Waterbody ID:	VAN-A30E
	Chronic dilution ratio:	20:1*	Acute dilution ratio:	10:1*

*Per 19 August 1994 stream model. These ratios were utilized during the Water Quality Criteria/Wasteload Allocation Analysis in **Attachment 7**.

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6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

X	State Water Control Law	X	EPA Guidelines
X	Clean Water Act	X	9VAC25-260 et seq. Virginia Water Quality Standards
X	VPDES Permit Regulation	X	COMAR 26.08.02 et seq. Maryland Water Quality Standards
X	EPA NPDES Regulation	X	9VAC25-820 et seq. *General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia*

7. Licensed Operator Requirements: Class II

8. Reliability Class: Class I

9. Facility / Permit Characterization:

	Private	X	Effluent Limited	X	Possible Interstate Effect
X	Federal	X	Water Quality Limited		Compliance Schedule
	State	X	Whole Effluent Toxicity Program		Interim Limits in Permit
	POTW		Pretreatment Program		Interim Limits in Other Document
X	eDMR Participant	X	Total Maximum Daily Load (TMDL)		

10. Wastewater Sources and Treatment Description:

The Naval Support Facility Dahlgren is a wastewater treatment plant with a current design capacity of 0.72 MGD. This federally owned treatment works (FOTW) treats domestic discharge from the Naval Support Facility Dahlgren, Barnesfield Park (seasonal) and USPO/MWR with a total population of approximately 8,900.

The facility consists of the following treatment processes: mechanical bar screen, primary clarifier, dual train bioreactor (anoxic/aerobic), secondary clarifiers, constructed wetlands, ultraviolet (UV) disinfection system and post aeration. Discharge is to the Upper Machodoc Creek via Outfall 001.

See **Attachment 2** for a facility schematic/diagram.

TABLE 1
OUTFALL DESCRIPTION

Number	Discharge Sources	Treatment	Design Flow	Latitude / Longitude
001	Domestic Wastewater	See Section 10	0.72 MGD	38° 19′ 15″ / 77° 01′ 40″
See **Attachment 3** for the Dahlgren topographic map.				

11. Sludge Treatment and Disposal Methods:

Sludge treatment consists of anaerobic digestion, lime addition for stabilization and pH adjustment prior to dewatering using a rotary fan press. The dewatered sludge is hauled to the King George County Landfill for disposal. This facility generates approximately 580 dry metric tons annually.

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12. Other Permitted Discharges Located Within Waterbody VAN-A30E:

TABLE 2
PERMITTED DISCHARGES

Permit Number	Facility Name	Type	Receiving Stream(s)
VA0026514	Dahlgren District Wastewater Treatment Plant	Municipal Discharge Individual Permit	Williams Creek
VA0073636	Naval Support Facility Dahlgren	Stormwater Industrial Individual Permit	Upper Machodoc Creek, UT
			Upper Machodoc Creek
			Black Marsh, UT
			Gambo Creek
VAR050866	B & M & King George Auto Parts, Inc.	Stormwater Industrial General Permit	Upper Machodoc Creek

13. Material Storage:

TABLE 3
MATERIAL STORAGE

Materials Description	Volume Stored	Spill/Stormwater Prevention Measures
DelPAC 2000 (Polyaluminum chloride solution)	2,500 gallons	Secondary containment
Bio-Carb (glycerin)	4,500 gallons	

14. Site Inspection:

A technical inspection was performed by DEQ-NRO Compliance staff on 9 May 2012. Please refer to **Attachment 4** for the inspection summary.

The entire inspection report is located in DEQ's Enterprise Content Management (ECM) System.

15. Receiving Stream Water Quality and Water Quality Standards:

a. Ambient Water Quality Data

The following is the water quality summary for this segment of Upper Machodoc Creek, as taken from the 2014 Draft Integrated Report:

The aquatic life use is considered not supporting; however, a Total Maximum Daily Load (TMDL) has been completed for the Chesapeake Bay watershed. Assessment of the submerged aquatic vegetation (SAV) acreage and thirty day mean dissolved oxygen values during the summer season indicates that the shallow-water submerged aquatic vegetation and the open-water aquatic life sub-uses are not met. The seven day mean and instantaneous dissolved oxygen levels have not been assessed.

The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, polychlorinated biphenyl (PCB) fish consumption advisory. A PCB TMDL for the tidal Potomac River watershed has been completed and approved.

The recreation and wildlife uses were not assessed.

The shellfish use has been removed.

b. 303(d) Listed Stream Segments and Total Maximum Daily Loads (TMDLs)

TABLE 4
RECEIVING STREAM SEGMENT 303(d) IMPAIRMENTS AND TMDLs

Waterbody Name	Impaired Use	Cause	TMDL Completion/Schedule	WLA	Basis for WLA
Impairment Information in the Draft 2014 Integrated Report					
Upper Machodoc Creek	Fish Consumption	PCBs	Tidal Potomac River Watershed PCBs TMDL 31 October 2007	0.064 grams/year PCB	0.064 ng/L PCB --- 0.72 MGD
	Aquatic Life	Aquatic Plants (Macrophytes)	Chesapeake Bay TMDL 29 December 2010	This facility is accounted for in the Chesapeake Bay TMDL. It is included in the NPDES Permit inventory (Table 9-4) and has been assigned WLAs for Total Nitrogen and Total Phosphorus, per Virginia's approved WIP. This facility is also included within the aggregated WLA for Total Suspended Solids.	
		Dissolved Oxygen			
	Shallow-water Submerged Aquatic Vegetation	Aquatic Plants (Macrophytes)			
	Open-water Aquatic Life	Dissolved Oxygen			

TABLE 5
DOWNSTREAM 303(d) IMPAIRMENTS AND TMDLs

Waterbody Name	Impaired Use	Cause	TMDL Completion/Schedule	WLA	Basis for WLA
Impairment Information in Maryland's 2014 Integrated Report					
Potomac River	Open-Water Fish and Shellfish	Total Nitrogen And Total Phosphorus	Chesapeake Bay TMDL 29 December 2010	This facility is accounted for in the Chesapeake Bay TMDL. It is included in the NPDES Permit inventory (Table 9-4) and has been assigned WLAs for Total Nitrogen and Total Phosphorus, per Virginia's approved WIP. This facility is also included within the aggregated WLA for Total Suspended Solids.	
	Seasonal Migratory Fish Spawning and Nursery				
	Seasonal Deep-Water Fish and Shellfish				
	Seasonal Deep-Channel Refuge				
	Seasonal Shallow-Water Submerged Aquatic Vegetation	Total Suspended Solids			

This facility discharges directly to the Upper Machodoc Creek; located within the Chesapeake Bay watershed. The receiving stream has been addressed in the Chesapeake Bay TMDL; completed by the Environmental Protection Agency (EPA) on 29 December 2010. The TMDL addresses dissolved oxygen (D.O.), chlorophyll a and submerged aquatic vegetation (SAV) impairments in the main stem Chesapeake Bay and its tidal tributaries by establishing nonpoint source load allocations (LAs) and point-source waste load allocations (WLAs) for total nitrogen (TN), total phosphorus (TP) and total suspended solids (TSS) to meet applicable Virginia Water Quality Standards contained in 9VAC25-260-185.

This facility is considered a Significant Chesapeake Bay wastewater discharge and has been assigned wasteload allocations as noted in Tables 4 and 5 above.

Implementation of the Chesapeake Bay TDML is currently accomplished in accordance with the Commonwealth of Virginia's Phase I Watershed Implementation Plan (WIP); approved by EPA on 29 December 2010. The approved WIP recognizes that the TMDL nutrient WLAs for Significant Chesapeake Bay wastewater dischargers are set in two regulations: (1) the Water Quality Management Planning Regulation, 9VAC25-720 et seq.; and (2) the *General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed of Virginia*, 9VAC25-820 et seq. The WIP states that since TSS discharges from wastewater facilities represent an insignificant portion of the Bay's total sediment load, they may be considered aggregated and wastewater discharges with minimum technology-based TSS limits are considered consistent with the TMDL.

40 CFR 122.44(d)(1)(vii)(B) requires permits to be written with effluent limits necessary to meet water quality standards and to be consistent with the assumptions and requirements of applicable WLAs. DEQ has provided coverage under the VPDES Nutrient General Permit (GP) for this facility under permit VAN010041. The requirements of the Nutrient GP currently in effect for this facility are consistent with the Chesapeake Bay TMDL. This individual permit includes TSS limits that are also consistent with the Chesapeake Bay TMDL and WIP. In addition, the individual permit addresses limitations for the protection of instream dissolved oxygen concentrations as detailed in Section 19 of this Fact Sheet. The proposed effluent limits within this individual permit are consistent with the Chesapeake Bay TMDL and will not cause an impairment or observed violation of the standards for D.O., chlorophyll a or SAV as required by 9VAC25-260-185.

The planning statement is found in **Attachment 5**.

c. Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream Upper Machodoc Creek is located within Section 2 of the Potomac River Basin and classified as Class II water.

Class II tidal waters in the Chesapeake Bay and it tidal tributaries must meet dissolved oxygen concentrations as specified in 9VAC25-260-185 and maintain a pH of 6.0 – 9.0 standard units as specified in 9VAC25-260-50. In the Northern Virginia area, Class II waters must meet the Migratory Fish Spawning and Nursery Designated Use from February 1 through May 31. For the remainder of the year, these tidal waters must meet the Open Water use. The applicable dissolved oxygen concentrations are presented in **Attachment 6**.

As stated earlier, this facility's discharge point is approximately 800 feet from the confluence of the Potomac River and has the potential to affect Maryland waters. Title 26, Subtitle 08 of the Code of Maryland Regulations (Maryland Water Quality Standards) has been reviewed and the proposed limitations contained within also comply with these regulations.

This portion of the Potomac River has been designated as Use II water, per COMAR 26.08.02.03-3 A.(8). The designated uses present in this segment are: Migratory Spawning and Nursery Use (February 1 to May 31); Shallow Water Submerged Aquatic Vegetation Use (April 1 to October 30); Open Water Fish and Shellfish Use (January 1 to December 31); Seasonal Deep Water Fish and Shellfish Use (June 1 to September 30); Seasonal Deep Channel Refuge Use (June 1 to September 30); and Shellfish Harvest.

The aforementioned designations provide for various dissolved oxygen (D.O.) concentrations during different periods of the year. The following is applicable to the Open Water Fish and Shellfish Subcategory and is the most stringent:

1). Greater than or equal to 5.5 mg/L for a 30-day averaging period year-round in tidal fresh waters (salinity less than or equal to 0.5 parts per thousand);

2). Greater than or equal to 5 mg/L for a 30-day averaging period year-round (salinity greater than 0.5 parts per thousand);

3). Greater than or equal to 4.0 mg/L for a 7-day averaging period year-round;

4). Greater than or equal to 3.2 mg/L as an instantaneous minimum year-round; and

5). For protection of the endangered shortnose sturgeon, greater than or equal to 4.3 mg/L as an instantaneous minimum at water column temperatures greater than 29° C (77° F).

pH values may not be less than 6.5 or greater than 8.5 standard units (S.U.).

The Virginia Freshwater Water Quality/Wasteload Allocation Analysis located in **Attachment 7** details other water quality criteria applicable to the receiving stream. Some Water Quality Criteria are dependent on the pH, temperature and total hardness of the receiving stream and/or final effluent. These values were utilized to determine the criterion for the following pollutants:

pH and Temperature for Ammonia Criteria

The fresh water, aquatic life Water Quality Criteria for ammonia is dependent on the instream pH and temperature. Since the effluent may have an impact on the instream values, the pH and temperature values of the effluent must also be considered when determining the ammonia criteria for the receiving stream. The 90th percentile pH and temperature values are utilized because they best represent the critical conditions of the receiving stream. Ambient water quality data from January 1990 to February 2011 found that the 90^{th} and 10^{th} percentile pH values are 7.9 S.U. and 6.5 S.U., respectively, and a summer temperature of 29.0° C and a winter temperature of 18.4° C are appropriate. This is the same data used during the last reissuance. Please refer to **Attachment 8** for the calculated ambient data. In addition, since this is considered a transition zone between fresh and salt water, it was staff's best professional judgement to assume an ambient salinity value of 10 parts per thousand in order to calculate the criteria. This value was based on the salinity values recorded at DEQ Monitoring Station 1AUMC004.43 (**Attachment 9**) and the subsequent calculated 90^{th} percentile value; ensuring a conservative and protective assumption.

Reported maximum and minimum effluent pH data for April 2011 through September 2015 reveals that 90^{th} and 10^{th} percentile values of 8.0 S.U. and 6.9 S.U., respectively, are appropriate. Since temperature data was not readily available, a default value of 25° C and an assumed value of 15° C will be utilized for summer and winter months, respectively. See **Attachment 10** for the effluent pH values.

Staff then compared the calculated ammonia criteria (**Attachment 7**) with those found in the Maryland Water Quality Standards, Numerical Criteria for Toxic Substances in Surface Waters (COMAR 26.08.02.03-2 J and K); utilizing a pH value of 8.0 S.U. and a temperature value of 25° C:

TABLE 6
SALTWATER AMMONIA CRITERIA

	Virginia	Maryland
Acute	3.55 mg/L	4.6 mg/L
Chronic	0.533 mg/L	0.69 mg/L

Since the criteria are more protective under the Virginia standards, these values will be utilized to calculate the ammonia limitations.

Hardness Dependent Metals Criteria

The Water Quality Criteria for some metals are dependent on the receiving stream and/or effluent total hardness values (expressed as mg/L calcium carbonate).

The hardness-dependent metals criteria found in **Attachment 7** are based on an average effluent value of 48 mg/L $CaCO_3$ and an average ambient value of 833 mg/L $CaCO_3$. The effluent value is based on data included in the Whole Effluent Toxicity test reports that were conducted during the last permit term. The calculated average ambient hardness value may be found in **Attachment 8**. It should be noted that the Water Quality Standards are valid within an average range of 25-400 mg/L $CaCO_3$. As in the case with the above ambient value, the program will self adjust for out-of-range values when the criteria are calculated.

Bacteria Criteria

The Virginia Water Quality Standards at 9VAC25-260-170.A state that the following criteria shall apply to protect primary recreational uses in surface waters:

Enterococci bacteria per 100 mL of water shall not exceed the following:

	Geometric Mean[1]
Saltwater and Transition Zone[2] enterococci	35

[1]For a minimum of four weekly samples taken during any calendar month
[2]See 9VAC25-260-140.C for freshwater and transition zone delineation

The Maryland Water Quality Criteria Specific to Designated Uses (Code of Maryland Regulations 26.08.02.03-3.A) states that sewage discharges shall be disinfected to achieve the following criteria and reflects the fecal coliform loading rates found in the stream model (**Attachment 1**):

Enterococci bacteria per 100 mL of water for all areas shall be as follows:

	Steady State Geometric Mean	Single Sample Maximum
Marine enterococci	35	104

The Maryland Department of the Environment (MDE) reviewed the proposed permit and recommended that the bacteria limitation should reflect Maryland's fecal coliform of 14 most probable number (MPN)/100 mL to ensure protection of propagating shellfish. DEQ staff acknowledged this request and proposes that the facility, in addition to enterococci, also monitor and report for fecal coliform. This bacterial sampling regime will be reassessed during the next reissuance to determine if both species are still warranted.

d. Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, Upper Machodoc Creek, is located within Section 2 of the Potomac River Basin. This section has been designated with a special standard of "a".

The receiving stream has been designated with a special standard of "a". According to 9VAC25-260-310.a., Special Standard "a" applies to all open ocean or estuarine waters capable of propagating shellfish or in specific areas where public or leased private shellfish beds are present, including those waters on which condemnation or restriction classifications are established by the State Department of Health. The fecal coliform bacteria standard is as follows: the geometric mean fecal coliform value for a sampling station shall not exceed an MPN (Most Probable Number) of 14 per 100 milliliters of sample and the 90th percentile shall not exceed 43 for a 5-tube, 3-dilution or 49 for a 3-tube, 3-dilution test. The shellfish are not to be so contaminated by radionuclides, pesticides, herbicides or fecal material that the consumption of shellfish might be hazardous. This same standard is also contained in 9VAC25-260-160 Fecal Coliform Bacteria; Shellfish Waters. This standard is used for the interpretation of instream monitoring data and not necessarily for setting fecal coliform effluent limitations.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

It is staff's best professional judgement that the receiving stream be classified as Tier 1 based on the noted downstream impairments and the Total Maximum Daily Loads (TMDLs) associated with the receiving stream.

The proposed permit limits have been established by determining wasteload allocations which will result in attaining and/or maintaining all water quality criteria which apply to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points are equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

For discharges into tidal water bodies, wasteload allocations should be based on site specific information concerning waste dispersion. A site specific dilution ratio of 10:1 for acute aquatic life criteria and a dilution ratio of 20:1 for chronic aquatic life criteria and human health criteria are used to prevent lethality in the allocated impact zone as determined by the stream model for the discharge (**Attachment 1**). Even though the modeled flow is greater than the design flow of this facility, it is staff's best professional judgement that this results in limits that are more protective.

Utilizing the dilution ratios, Wasteload Allocations (WLAs) are calculated. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. In the case of ammonia evaluations, limits are needed if the 97th percentile of the thirty-day average effluent concentration value is greater than the chronic WLA. Effluent limitations are the calculated on the most limiting WLA, the required sampling frequency and statistical characteristics of the effluent data.

a. Effluent Screening

Effluent data obtained from the permit application and April 2011 – September 2015 Discharge Monitoring Reports (DMRs) has been reviewed and determined to be suitable for evaluation. Please see **Attachment 11** for a summary of reported DMR effluent data.

b. Effluent Limitations, Outfall 001 – Toxic Pollutants

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Ammonia as N/TKN

DEQ-NRO and the Virginia Department of Health (VDH) approved plans and specifications for facility upgrades in 1995. The engineering design basis stated that these upgrades would allow the facility to achieve ammonia limits of 5 mg/L. The Certificate to Operate was issued in 2010 after final completion of the upgrades (**Attachment 12**).

The above technology limits were compared with those calculated (**Attachment 13**) utilizing the wasteload allocations found in **Attachment 7**. The technology installed and subsequent treatment capabilities are found more stringent than the calculated limits based on water quality standards. Therefore, it is staff's best professional judgement that the technology based limits are applicable and more protective of the receiving stream. This limit also ensures that the facility complies with the Maryland Water Quality Standards.

2) Total Residual Chlorine (TRC)

This facility utilizes ultraviolet (UV) radiation for final effluent disinfection; therefore, chlorine limit derivation is not warranted.

3) Metals/Organics

It is staff's best professional judgement that given the wastewater sources; limitations are not warranted at this time.

c. Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

No changes to pH, biochemical oxygen demand-5 day (BOD_5), total suspended solids (TSS), dissolved oxygen (D.O.), ammonia, as N and enterococci limitations are proposed.

BOD_5 limitations are based on the stream modeling conducted in August 1994 (**Attachment 1**).

It is staff's practice to equate the TSS limits with the BOD_5 limits since the two pollutants are closely related in terms of treatment of domestic sewage.

Dissolved oxygen and pH limitations are set at the Maryland Water Quality Standards; COMAR 26.08.02.03-3 B.(8).

Ammonia limitations are based on the technology installed (**Attachment 12**).

Fecal coliform limitations are in accordance with the Virginia Water Quality Standards 9VAC25-260-160 and Maryland Water Quality Standards COMAR 26.08.02.03-3 C.(1)(a).

Enterococci limitations are in accordance with the Virginia Water Quality Standards 9VAC25-260-170 and are equivalent to the Maryland Water Quality Standards COMAR 26.08.02.03-3 A.(1)(a).

d. Effluent Annual Average Limitations and Monitoring, Outfall 001 – Nutrients

VPDES Regulation 9VAC25-31-220(D) requires effluent limitations that are protective of both the numerical and narrative water quality standards for state waters, including the Chesapeake Bay.
As discussed in Section 15, significant portions of the Chesapeake Bay and its tributaries are listed as impaired with nutrient enrichment cited as one of the primary causes. Virginia has committed to protecting and restoring the Bay and its tributaries. Only concentration limits are now found in the individual VPDES permit when the facility installs nutrient removal technology. The basis for the concentration limits is 9VAC25-40 – *Regulation for Nutrient Enriched Waters and Dischargers within the Chesapeake Bay Watershed* which requires new or expanding discharges with design flows of ≥ 0.04 MGD to treat for TN and TP to either BNR (Biological Nutrient Removal) levels (TN = 8 mg/L; TP = 1.0 mg/L) or SOA (State of the Art) levels (TN = 3.0 mg/L and TP = 0.3 mg/L).

This facility has also obtained coverage under 9VAC25-820 – *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia.* This regulation specifies and controls the nitrogen and phosphorus loadings from facilities and specifies facilities that must register under the general permit. Nutrient loadings for those facilities registered under the general permit as well as compliance schedules and other permit requirements, shall be authorized, monitored, limited, and otherwise regulated under the general permit and not this individual permit. This facility has coverage under this General Permit; the permit number is VAN010041. Total Nitrogen Annual Loads and Total Phosphorus Annual Loads from this facility are found in 9VAC25-720 – *Water Quality Management Plan Regulation* which sets forth TN and TP maximum wasteload allocations for facilities designated as significant discharges, i.e. those with design flows of ≥ 0.5 MGD above the fall line and > 0.1 MGD below the fall line.

Monitoring for nitrates + nitrites, total Kjeldahl nitrogen, total nitrogen, and total phosphorus are included in this permit. The monitoring is needed to protect the Chesapeake Bay Water Quality Standards. Monitoring frequencies are set at the frequencies as set forth in 9VAC25-820. Annual average effluent limitations, as well as monthly and year to date calculations, for total nitrogen and total phosphorus are included in this individual permit. The annual averages are based on the technology installed and the engineering basis of design (**Attachment 12**).

e. Effluent Limitations and Monitoring Summary

The effluent limitations are presented in Section 19. Limits were established for pH, biochemical oxygen demand-5 day (BOD_5), total suspended solids (TSS), ammonia as N, dissolved oxygen (D.O.), fecal coliform, enterococci, total nitrogen (calendar year) and total phosphorus (calendar year).

The facility must also monitor Whole Effluent Toxicity on an annual basis. See Section 20.b. of this Fact Sheet for details.

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/L), with the flow values (in MGD) and then a conversion factor of 3.785.

Sample Frequencies are in accordance with the recommendations in the current VPDES Permit Manual.

The permittee has requested that the Sample Type be a 24H-C in lieu of the recommended 8H-C as stated in the current VPDES Permit Manual. See Section 24 of this Fact Sheet.

The VPDES Permit Regulation at 9VAC25-31-30 and 40 CFR Part 133 require that the facility achieve at least 85% removal for BOD and TSS (or 65% for equivalent to secondary). The limits in this permit are water quality-based effluent limits and result in greater than 85% removal.

18. Antibacksliding:

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.

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19. Effluent Limitations/Monitoring Requirements:

Design flow is 0.72 MGD.

Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	Continuous	TIRE
pH	3	NA	NA	6.5 S.U.	8.5 S.U.	1/D	Grab
Biochemical Oxygen Demand (BOD_5)	1,3,4,5	30 mg/L 82 kg/day	45 mg/L 120 kg/day	NA	NA	3D/W	24H-C
Total Suspended Solids (TSS)	2	30 mg/L 82 kg/day	45 mg/L 120 kg/day	NA	NA	3D/W	24H-C
Dissolved Oxygen (DO)	3,5	NA	NA	5.5 mg/L	NA	1/D	Grab
Ammonia, as N	6	5.0 mg/L	5.0 mg/L	NA	NA	3D/W	24H-C
Fecal Coliform (Geometric Mean) [a]	3,4,5	14 n/100 mL	NA	NA	NA	1/W	Grab
Enterococci (Geometric Mean) [a]	3,4,5	35 n/100 mL	NA	NA	NA	3D/W	Grab
Total Kjeldahl Nitrogen (TKN)	3,4	NL mg/L	NA	NA	NA	1/2W	24H-C
Nitrate+Nitrite, as N	3,4	NL mg/L	NA	NA	NA	1/2W	24H-C
Total Nitrogen [b]	7,8,9	NL mg/L	NA	NA	NA	1/2W	Calculated
Total Nitrogen – Year to Date [c]	7,8,9	NL mg/L	NA	NA	NA	1/M	Calculated
Total Nitrogen – Calendar Year [c]	6,7,8,9	7.0 mg/L	NA	NA	NA	1/YR	Calculated
Total Phosphorus	7,8,9	NL mg/L	NA	NA	NA	1/2W	24H-C
Total Phosphorus – Year to Date [c]	7,8,9	NL mg/L	NA	NA	NA	1/M	Calculated
Total Phosphorus – Calendar Year [c]	6,7,8,9	2.0 mg/L	NA	NA	NA	1/YR	Calculated
Chronic Toxicity – *M. bahia* [d]		NA	NA	NA	NL TU_c	1/YR	24H-C
Chronic Toxicity – *C. variegates* [d]		NA	NA	NA	NL TU_c	1/YR	24H-C

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgement
3. Maryland Water Quality Standards (COMAR 26.08.02 et seq.)
4. Virginia Water Quality Standards (9VAC25-260 et seq.)
5. Stream Model – **Attachment 1**
6. Basis of design/CTO – **Attachment 12**
7. 9VAC25-40 (Nutrient Regulation)
8. 9VAC25-820 (Watershed General Permit)
9. Chesapeake Bay TMDL/WIP

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.
TIRE = Totalizing, indicating and recording equipment.

1/D = Once every day.
3D/W = Three days a week.
1/2W = Once every two weeks.
1/M = Once every month.
1/YR = Once every calendar year.

24H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the monitored 24-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of twenty-four (24) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum twenty-four (24) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by 10% or more during the monitored discharge.

Grab = An individual sample collected over a period of time not to exceed 15 minutes.

[a] Samples shall be collected between 10:00 a.m. and 4:00 p.m.

[b] Total Nitrogen = Sum of TKN plus Nitrate+Nitrite.

[c] See Section 20.a. for more information concerning the Nutrient Calculations.

[d] See Section 20.b. for Whole Effluent Toxicity Requirements.

20. Other Permit Requirements:

a. Part I.B. of the permit contains quantification levels and compliance reporting instructions

9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an instream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

The calculations for the nitrogen and phosphorus parameters shall be in accordance with the calculations set forth in 9VAC25-820 – *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia.* §62.1-44.19:13 of the Code of Virginia defines how annual nutrient loads are to be calculated; this is carried forward in 9VAC25-820-70. As annual concentrations (as opposed to loads) are limited in the individual permit, these reporting calculations are intended to reconcile the reporting calculations between the permit programs, as the permittee is collecting a single set of samples for the purpose of ascertaining compliance with two permits.

b. Part I.C. of the permit details the requirements for Whole Effluent Toxicity (WET) Program

Whole Effluent Toxicity (WET) refers to the aggregate toxic effect to aquatic organisms from all pollutants present within a facility's wastewater effluent. This program is one approach to comply with the Clean Water Act's prohibition of the discharge of toxic pollutants in toxic amounts. WET testing allows for the measurement of the wastewater's potential effects on specific test organism's ability to survive, grow and reproduce.

The VPDES Permit Regulation at 9VAC25-31-220.D.1.a-d. requires limitations in permits to provide for and ensure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. Limitations must control all pollutants or pollutant parameters which the Board determines are or may be discharged at a level which will cause, have the reasonable potential to cause or contribute to an excursion above any Virginia water quality standard, including narrative criteria. The determination whether a discharge causes or contributes to an instream excursion above a narrative or numeric criteria shall utilize procedures which account for existing controls on sources of pollution, variability of the pollutant, species sensitivity and dilution of the effluent in the receiving stream. If it is determined that a reasonable potential exists to cause or contribute to an instream excursion of narrative criterion of the water quality standard, the permit must contain effluent limits for whole effluent toxicity. However, limits may not be necessary when it is demonstrated that chemical-specific limits are sufficient to attain and maintain applicable numeric and narrative water quality standards.

A WET Program is imposed for municipal facilities with a design rate >1.0 MGD, all facilities with an approved pretreatment program or required to develop a pretreatment program and/or those required by the Board based on effluent variability, compliance history, instream waste concentration (IWC), existing pollutant controls and/or receiving stream characteristics. This facility serves a comprehensive research and development complex which could potentially result in a pollutant pass through, producing possible effluent toxicity issues. Therefore it is staff's best professional judgement that WET testing be carried forward with this reissuance.

As referenced above, reasonable potential determinations must take into account the variability of the pollutant or pollutant parameter in the effluent, sensitivity of the species to toxicity testing and, as appropriate, the dilution of the effluent in the receiving stream. This warrants a sampling regime that rotates throughout a given calendar year; a quarterly schedule in order to obtain seasonal perspectives that encompass that potential variableness listed prior. This methodology coincides with the VPDES Permit Regulation requirements that facilities submit representative data that reflects the seasonal variation in the discharge with each permit application (9VAC25-31-100.K.4.g.). Therefore, it is staff's best professional judgement that a WET testing protocol be proposed with this permit action that requires a rotating, quarterly testing regime for each annual monitoring requirement. The schedule as set forth within Part I.D. of the permit will ensure that the discharge is monitored for whole effluent toxicity and demonstrates seasonal variations.

Previous WET results have indicated that the effluent is not toxic to the test species. See **Attachment 14** for a summary of the past test results. **Attachment 15** details the statistical evaluation of the previous WET results indicating that a limit is not warranted. **Attachment 16** documents the calculated compliance endpoints that will be carried forward with this reissuance.

21. Other Special Conditions:

a. 95% Capacity Reopener. The permittee shall develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. Basis for this is best professional judgement.

b. Indirect Dischargers. The VPDES Permit Regulation at 9VAC25-31-280.B.9. requires that the Board provide an explanation on the regulation of users (i.e., industrial, indirect dischargers) to treatment works not owned by a state or a municipality. The Naval Support Facility Dahlgren WWTP serves a Research and Development complex; thus, creating a potential for pollutants to pass through or interfere with the operation of the treatment plant. Therefore it is staff's best professional judgement that VPDES Permit Regulation, 9VAC25-31-200.B.1 and B.2 is applicable since this facility receives waste from someone other than the owner of the treatment works.

c. Operations & Maintenance (O&M) Manual Requirement. Required by the Code of Virginia §62.1-44.19; the Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall maintain a current O&M Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

d. CTC, CTO Requirement. The Code of Virginia § 62.1-44.19 and the Sewage Collection and Treatment Regulations, 9VAC25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct (CTC) prior to commencing construction and to obtain a Certificate to Operate (CTO) prior to commencing operation of the treatment works.

e. Licensed Operator Requirement. The Code of Virginia at §54.1-2300 et seq. and the VPDES Permit Regulation at 9VAC25-31-200.C., and by the Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals Regulations (18VAC160-20-10 et seq.) requires licensure of operators. This facility requires a Class II operator.

f. Reliability Class. The Sewage Collection and Treatment Regulations at 9VAC25-790 require sewage treatment works to achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. Reliability means a measure of the ability of the treatment works to perform its designated function without failure or interruption of service. The facility is required to meet a reliability Class of I.

g. Sludge Reopener. The VPDES Permit Regulation at 9VAC25-31-220.C. requires all permits issued to treatment works treating domestic sewage (including sludge-only facilities) include a reopener clause allowing incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the CWA. The facility includes a sewage treatment works.

h. Sludge Use and Disposal. The VPDES Permit Regulation at 9VAC25-31-100.P; 220.B.2, and 420 through 720 and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. The facility includes a treatment works treating domestic sewage.

i. E3/E4. 9VAC25-40-70.B. authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by subsection A of this section. Such alternate compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology-based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.

j. Nutrient Reopener. 9VAC25-40-70.A. authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. 9VAC25-31-390.A. authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

(Remainder of page intentionally left blank)

k. Water Quality Criteria Monitoring. State Water Control Law §62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters. States are required to review data on discharges to identify actual or potential toxicity problems, or the attainment of water quality goals, according to 40 CFR Part 131, Water Quality Standards, subpart 131.11. To ensure that water quality criteria are maintained, the permittee is required to analyze the facility's effluent for the substances noted in Attachment A of this VPDES permit. The results will be due concurrently with the application for the next reissuance.

l. Polychlorinated biphenyl (PCB) Pollutant Minimization Plan. This special condition requires the permittee, upon notification from DEQ-NRO, to submit a Pollutant Minimization Plan (PMP) to identify known and unknown sources of low-level PCBs in the effluent. This special condition details the contents of the PMP and also requires an annual report on progress to identify sources.

m. Total Maximum Daily Load (TMDL) Reopener. Section 303(d) of the Clean Water Act requires that TMDLs be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that, according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan or other wasteload allocation prepared under section 303 of the Act.

22. Permit Section Part II.

Required by VPDES Regulation 9VAC25-31-190, Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Changes to the Permit from the Previously Issued Permit:

a. Special Conditions:

- The PCB Monitoring condition was removed with this reissuance since the facility completed the sampling and reporting requirements during the previous permit term.
- The PCB Pollutant Minimization Plan was included if it is determined that minimization efforts are warranted.
- The Water Quality Criteria Monitoring condition was included with this reissuance requiring Attachment A sampling and reporting.

b. Monitoring and Effluent Limitations:

- Total Kjeldahl Nitrogen reporting was included with this reissuance; reflecting current agency practice concerning monitoring of nutrient constituents.
- Enterococci limitations were replaced with fecal coliform for the protection of human health associated with shellfish consumption. See Section 26 for further details.

24. Variances/Alternate Limits or Conditions:

The Sample Type as proposed in this reissuance as was the case during the previous term is a 24-hour composite in lieu of the 8-hour composite as recommended in the current VPDES Permit Manual. This deviation was requested by the permittee during the drafting of the previous permit and will be carried forward with this permitting action.

(Remainder of page intentionally left blank)

25. Public Notice Information:

First Public Notice Date: 11 February 2016 Second Public Notice Date: 18 February 2016

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected and copied by contacting the: DEQ Northern Regional Office; 13901 Crown Court; Woodbridge, VA 22193; Telephone No. 703-583-3873, Douglas.Frasier@deq.virginia.gov. See **Attachment 17** for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

26. Additional Comments:

Previous Board Action(s):	Not applicable.
Staff Comments:	No comments were received during the drafting of this permit.
State/Federal Agency Comments:	Virginia Department of Health had no comments or objections regarding this reissuance. Maryland Department of the Environment staff, upon review of the initial draft, noted that the proposed bacterial limitations for enterococci reflected the recreational criteria for protection of human health and not for shellfish consumption (**Attachment 18**). DEQ staff acknowledged the recommendation and proposed that the facility monitor for both enterococci and fecal coliform during this permit term. Staff will reassess the need to monitor for both bacterial species during the next reissuance.
Public Comments:	No comments were received during the public notice.
Owner Comments:	No comments were received.

Fact Sheet Attachments

Table of Contents

Naval Support Facility Dahlgren Wastewater Treatment Plant
VA0021067
2016 Reissuance

ATTACHMENT 1

Flow Frequency Determination
Stream Model

MALCOLM PIRNIE

MALCOLM PIRNIE, INC.
ENVIRONMENTAL ENGINEERS, SCIENTISTS & PLANNERS

August 19, 1994

Ms. Ann Swope
Dahlgren Division
Naval Surface Warfare Center
Dahlgren, Virginia 22448-5000

Re: NPDES Permit; Water Quality Modeling; Addendum to the September 1992 Report.

Dear Ms. Swope:

We have reviewed our files on the surface water quality modeling conducted to support the Dahlgren NSWC NPDES application. The following tasks have been conducted in response to your request to revise modeling results to simulate a 750,000 gallon per day (gpd) discharge:

- Re-calculated loading rates based on 750,000 gpd discharge
- Re-ran the Marina model using the new loading rates
- Re-evaluated Fecal Coliform and toxics distribution
- Re-evaluated Dissolved Oxygen Sag (DO Sag)
- Revised figures 3-1, 3-2, 3-3, and 3-4 in the September 1992 report

Loading Rates

The loading rates for fecal coliform (average and maximum reported values), a simulated conservative substance at 100μg/L, cyanide at a concentration of 20 μg/L, and biological oxygen demand (BOD) were recalculated using the new discharge rate of 750,000 gpd. The new loading rates are presented below:

Parameter	Previous Loading Rate	New Loading Rate
F.Coli Avg.- 59 MPN/100 ml	1.55 x 10^4 MPN/sec	1.94 x 10^4 MPN/sec
F.Coli Max - 310 MPN/100 ml	8.15 x 10^4 MPN/sec	1.02 x 10^5 MPN/sec
Conservative Substance at 100 μg/L	2.63 x 10^3 μg/sec	3.29 x 10^3 μg/sec
Cyanide at 20 μg/L	5.26 x 10 5 ηg/sec	6.57 x 10 5 ηg/sec
Biological Oxygen Demand	234 lb/day	291 lb/day

11832 ROCK LANDING DRIVE SUITE 400 NEWPORT NEWS, VA 23606-4206 804-873-8700 FAX 8(

Attachment 1

Marina Model

The new loading rates presented in the above table were used as input to the Marina model used previously. All other model variables (Average channel depth, dispersion, river velocity, channel width, and the parameter respective decay constants) remained unchanged. The resulting model output diagrams are enclosed.

Re-evaluation of Water Quality Modeling Results

Fecal Coliform

Results of the Fecal Coliform model run indicated only slight increases in the distance of the outfall plume. Figure 3-1 (revised) shows the new contour line for 4 MPN/100 ml, based on the average fecal coliform concentration of 59 MPN/100 ml. As with the previous model run from the September 1992 document, at a distance of 1 meter from the outfall the fecal coliform concentration is below the Virginia Department of Health limit of 14 MPN/100 ml. Figure 3-2 (revised) shows the new predicted position of the 14 MPN/100 ml limit for the reported maximum fecal coliform outfall concentration of 310 MPN/100 ml. This distribution indicates that at a distance of 25 meters perpendicular to the STP outfall, the concentration of fecal coliform drops below the VDH limit and that approximately 25 meters upstream and 75 meters downstream of the outfall the fecal coliform concentration falls below the VDH limit. In both cases, the predicted fecal coliform concentrations above the VDH limit would not increase the existing closed shellfish areas; therefore, its is not expected that any existing harvesting areas would be impacted.

Toxics

Figure 3-3 (revised) shows the distribution contours representing percent dilution of a conservative substance. At approximately 10 meters perpendicular to the STP outfall, the concentration is reduced by 90 percent. Upstream 90 percent reduction occurs at approximately 9 meters while downstream 90 percent reduction occurs at approximately 16 meters.

Cyanide distribution contour is shown in Figure 3-4 (revised). The contour line represents the 1.0 μg/L marine acute criterion for surface water set by the EPA. The graphic shows that the allocated impact zone based on this limit extends perpendicular from the outfall a distance of approximately 25 meters. The upstream extent is approximately 27 meters, while the downstream extent of the 1.0 μg/L contour is approximately 100 meters.

BOD

As in the previous study the new BOD loading rate remained relatively small. The calculated DO deficit based on the new BOD loading rate is still negligible. The DO deficit was calculated to be 9.82×10^{-4} mg/L.

MALCOLM PIRNIE

If you have any questions or should need further assistance please do not hesitate to call me.

Very truly yours,

MALCOLM PIRNIE, INC.

Bruce W. Schwenneker

Bruce W. Schwenneker, Ph.D.
Senior Associate

djk
1613-201-100

Enclosures

DKL819.BWS

RESULTS FOR USER DESIGNATED EXAMPLE fc310.dat

Fecal Coliform Distribution @ a Concentration of 310 MPN/100ml

INPUT IN MKS UNITS:

M	H	DX	DY	U	B	KD
-	-	--	--	-	-	--
0.102E+06	0.200E+01	0.210E+00	0.700E-01	0.400E-02	0.100E+04	0.100E-04

*** CONCENTRATION IN ORGANISMS PER 100 ML ***

EVALUATION IS FROM -5 TO 5

VALUES OF Y/B (COLUMNS) & X/B (ROWS):

	0.000	0.005	0.010	0.015	0.020	0.025	0.030	0.035	0.040	0.045	0.050	0.055	0.060	0.065	0.070	0.075	0.080	0.085	0.090	0.
			10m								50m									
-0.100	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
-0.095	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	
-0.090	2	2	2	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	
-0.085	2	2	2	2	2	2	1	1	1	1	1	1	1	1	0	0	0	0	0	
-0.080	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	0	0	0	0	
-0.075	3	3	3	3	2	2	2	2	2	1	1	1	1	1	1	1	0	0	0	
-0.070	3	3	3	3	3	3	2	2	2	2	1	1	1	1	1	1	0	0	0	
-0.065	4	4	4	3	3	3	3	2	2	2	2	1	1	1	1	1	1	0	0	
-0.060	4	4	4	4	4	3	3	3	2	2	2	2	1	1	1	1	1	1	0	
-0.055	5	5	5	5	4	4	3	3	3	2	2	2	1	1	1	1	1	1	0	
-0.050	6	6	6	5	5	4	4	3	3	3	2	2	2	1	1	1	1	1	1	
-0.045	7	7	7	6	6	5	4	4	3	3	2	2	2	2	1	1	1	1	1	
-0.040	8	8	8	7	6	6	5	4	4	3	3	2	2	2	1	1	1	1	1	
-0.035	10	10	9	8	7	6	5	5	4	4	3	3	2	2	2	1	1	1	1	
-0.030	12	11	11	9	8	7	6	5	4	4	3	3	2	2	2	1	1	1	1	
-0.025	14	14	12	11	9	8	7	6	5	4	4	3	3	2	2	2	1	1	1	
-0.020	17	16	14	12	10	9	7	6	5	5	4	3	3	2	2	2	1	1	1	
-0.015	21	20	17	14	11	10	8	7	6	5	4	4	3	3	2	2	2	1	1	
-0.010	27	24	19	15	12	10	9	7	6	5	4	4	3	3	2	2	2	1	1	
-0.005	37	28	21	17	13	11	9	8	7	6	5	4	3	3	3	2	2	2	1	
0.000	9999	32	23	18	14	12	10	8	7	6	5	4	4	3	3	2	2	2	1	
0.005	41	31	23	18	15	12	10	9	7	6	5	4	4	3	3	2	2	2	1	
0.010	33	29	23	19	15	13	11	9	8	6	5	5	4	3	3	3	2	2	2	
0.015	28	26	22	18	15	13	11	9	8	7	6	5	4	4	3	3	2	2	2	
0.020	25	24	21	18	15	13	11	9	8	7	6	5	4	4	3	3	2	2	2	
0.025	23	22	20	18	15	13	11	10	8	7	6	5	5	4	3	3	2	2	2	
0.030	21	21	19	17	15	13	11	10	8	7	6	5	5	4	3	3	3	2	2	
0.035	20	19	18	16	15	13	11	10	8	7	6	6	5	4	4	3	3	2	2	
0.040	19	18	17	16	14	13	11	10	8	7	6	6	5	4	4	3	3	2	2	
0.045	18	17	16	15	14	12	11	10	9	7	7	6	5	4	4	3	3	2	2	
0.050	17	16	16	15	13	12	11	10	9	8	7	6	5	4	4	3	3	3	2	
0.055	16	16	15	14	13	12	11	10	8	8	7	6	5	5	4	3	3	3	2	
0.060	15	15	14	14	13	12	10	9	8	8	7	6	5	5	4	4	3	3	2	
0.065	14	14	14	13	12	11	10	9	8	7	7	6	5	5	4	4	3	3	2	
0.070	14	14	13	13	12	11	10	9	8	7	7	6	5	5	4	4	3	3	2	
0.075	13	13	13	12	11	11	10	9	8	7	7	6	5	5	4	4	3	3	2	
0.080	13	13	12	12	11	10	10	9	8	7	7	6	5	5	4	4	3	3	3	
0.085	12	12	12	11	11	10	9	9	8	7	7	6	5	5	4	4	3	3	3	
0.090	12	12	11	11	11	10	9	9	8	7	7	6	5	5	4	4	3	3	3	
0.095	11	11	11	11	10	10	9	8	8	7	6	6	5	5	4	4	3	3	3	
0.100	11	11	11	10	10	9	9	8	8	7	6	6	5	5	4	4	3	3	3	

Conservative substance distribution @ 100 µg/L.
Note: output values are interpreted as percent dilution – a value of 23 = 2.3% of original concentration
23/10 = 2.3%

RESULTS FOR USER DESIGNATED EXAMPLE consvtv.dat

INPUT IN MKS UNITS:

M	H	DX	DY	U	B	KD
0.329E+06	0.200E+01	0.210E+00	0.700E-01	0.400E-02	0.100E+04	0.100E-19

*** CONCENTRATION IN ORGANISMS PER 100 ML ***

EVALUATION IS FROM -5 TO 5

VALUES OF Y/B (COLUMNS) & X/B (ROWS):

	0.000	0.005	0.010	0.015	0.020	0.025	0.030	0.035	0.040	0.045	0.050	0.055	0.060	0.065	0.070	0.075	0.080	0.085	0.090	0.09
						25m							60m							
-0.050	25	25	24	23	21	19	18	16	14	13	12	10	9	8	7	7	6	5	5	
-0.047	27	27	26	24	22	20	19	17	15	13	12	11	10	9	8	7	6	6	5	
-0.045	29	29	28	26	24	22	19	18	16	14	13	11	10	9	8	7	6	6	5	
-0.043	31	31	29	27	25	23	20	18	16	15	13	12	10	9	8	7	7	6	5	
-0.040 40m	34	33	31	29	27	24	22	19	17	15	14	12	11	10	9	8	7	6	6	
-0.038	36	36	34	31	28	25	23	20	18	16	14	13	11	10	9	8	7	6	6	
-0.035	39	38	36	33	30	27	24	21	19	17	15	13	12	10	9	8	7	7	6	
-0.033	42	41	39	35	31	28	25	22	20	17	15	14	12	11	10	9	8	7	6	
-0.030	45	44	41	37	33	29	26	23	20	18	16	14	13	11	10	9	8	7	6	
-0.028	49	48	44	40	35	31	27	24	21	19	17	15	13	12	10	9	8	7	7	
-0.025	54	52	47	42	37	32	28	25	22	19	17	15	13	12	11	9	8	8	7	
-0.023	58	56	51	45	39	34	30	26	23	20	18	16	14	12	11	10	9	8	7	
-0.020	64	61	54	47	41	35	31	27	24	21	18	16	14	13	11	10	9	8	7	
-0.018	70	66	58	50	43	37	32	28	24	21	19	17	15	13	12	10	9	8	7	
-0.015	77	72	62	53	45	38	33	29	25	22	20	17	15	14	12	11	10	9	8	
-0.013	86	79	66	55	47	40	34	30	26	23	20	18	16	14	12	11	10	9	8	
-0.010	97	86	70	58	49	41	36	31	27	24	21	18	16	14	13	11	10	9	8	
-0.008	110	94	74	60	50	43	37	32	28	24	21	19	17	15	13	12	10	9	8	
-0.005	130	101	78	63	52	44	38	33	28	25	22	19	17	15	13	12	11	9	8	
-0.003	162	108	81	65	54	45	39	34	29	26	22	20	18	16	14	12	11	10	9	
0.000	9999	113	83	66	55	46	40	34	30	26	23	20	18	16	14	13	11	10	9	
0.002	170	114	85	68	56	48	41	35	31	27	24	21	18	16	14	13	11	10	9	
0.005	143	112	86	69	57	49	42	36	31	27	24	21	19	17	15	13	12	10	9	
0.007	128	108	86	70	58	49	42	37	32	28	25	22	19	17	15	14	12	11	10	
0.010 10m	117	104	85	70	59	50	43	37	33	29	25	22	20	17	16	14	12	11	10	
0.012	109	100	84	70	59	51	44	38	33	29	26	23	20	18	16	14	13	11	10	
0.015	103	96	83	70	60	51	44	39	34	30	26	23	20	18	16	14	13	11	10	
0.017	98	92	81	70	60	52	45	39	34	30	27	24	21	19	17	15	13	12	10	
0.020	94	89	80	69	60	52	45	40	35	31	27	24	21	19	17	15	13	12	11	1
0.022	90	86	78	69	60	52	46	40	35	31	27	24	22	19	17	15	14	12	11	1
0.025	86	84	76	68	60	52	46	40	36	31	28	25	22	20	17	16	14	12	11	1
0.027	84	81	75	67	60	52	46	41	36	32	28	25	22	20	18	16	14	13	11	1
0.030 30m	81	79	73	66	59	52	46	41	36	32	29	25	23	20	18	16	14	13	12	1
0.032	79	77	72	66	59	52	47	41	37	33	29	26	23	21	18	16	15	13	12	1
0.035	76	75	71	65	58	52	47	41	37	33	29	26	23	21	19	17	15	13	12	1
0.037	74	73	69	64	58	52	47	42	37	33	30	26	24	21	19	17	15	14	12	1
0.040	73	71	68	63	58	52	47	42	37	33	30	27	24	21	19	17	15	14	12	1
0.042	71	70	67	62	57	52	47	42	38	34	30	27	24	22	19	17	16	14	13	1
0.045	69	68	66	61	57	52	47	42	38	34	30	27	24	22	20	18	16	14	13	1
0.047	68	67	64	61	56	51	47	42	38	34	31	28	25	22	20	18	16	15	13	1
0.050	67	66	63	60	55	51	46	42	38	34	31	28	25	22	20	18	16	15	13	1

RESULTS FOR USER DESIGNATED EXAMPLE a:\rerun\cn.

INPUT IN MKS UNITS:

Cyanide distribution at a Concentration of 20μg/L

M	H	DX	DY	U	B	KD
-	-	--	--	-	-	--
0.657E+06	0.200E+01	0.210E+00	0.700E-01	0.400E-02	0.100E+04	0.100E-08

*** CONCENTRATION IN ORGANISMS PER 100 ML ***

EVALUATION IS FROM -5 TO 5

VALUES OF Y/B (COLUMNS) & X/B (ROWS):

	0.000	0.005	0.010	0.015	0.020	0.025	0.030	0.035	0.040	0.045	0.050	0.055	0.060	0.065	0.070	0.075	0.080	0.085	0.090	0.09
			10m			25m					50m					75m				
-0.100	15	14	14	14	13	13	12	11	11	10	9	9	8	7	7	6	6	5	5	
-0.093	17	17	17	17	16	15	14	13	13	12	11	10	9	8	8	7	6	6	5	
-0.085	21	21	20	20	19	18	17	16	15	14	12	11	10	10	9	8	7	7	6	
-0.078	25	25	24	24	23	21	20	19	17	16	14	13	12	11	10	9	8	7	7	
-0.070	30	30	29	28	27	25	23	22	20	18	17	15	14	12	11	10	9	8	8	
-0.062	37	36	35	34	32	30	27	25	23	21	19	17	16	14	13	12	10	9	8	
-0.055	45	44	43	41	38	35	32	29	27	24	22	20	18	16	14	13	12	10	9	
-0.047	55	54	52	49	45	41	37	34	31	27	25	22	20	18	16	14	13	12	10	
-0.040	68	67	63	59	54	48	43	39	35	31	28	25	22	20	18	16	14	13	12	1
-0.032	85	83	77	71	63	56	50	44	39	35	31	28	25	22	20	18	16	14	13	1
-0.025	107	104	95	84	74	65	57	50	44	39	35	31	27	24	22	19	17	16	14	1
-0.017	140	133	116	100	86	74	64	56	49	43	38	34	30	27	24	21	19	17	15	1
-0.010	194	172	141	116	97	83	71	62	54	47	42	37	33	29	26	23	21	18	17	1
-0.002	324	217	162	130	108	91	78	67	59	52	45	40	35	31	28	25	22	20	18	1
0.005	286	223	171	138	115	97	84	72	63	55	49	43	38	34	30	27	24	21	19	1
0.013	219	200	168	141	119	102	88	76	67	59	52	46	41	36	32	29	26	23	21	1
0.020	187	179	160	139	120	104	91	80	70	62	54	48	43	38	34	30	27	24	22	2
0.028	167	162	150	135	119	105	93	82	72	64	57	51	45	40	36	32	29	26	23	2
0.035	153	150	141	130	117	105	94	83	74	66	59	53	47	42	38	34	30	27	25	2
0.043	142	140	134	125	114	104	94	84	76	68	61	54	49	44	39	35	32	29	26	2
0.050	133	132	127	120	111	102	93	84	76	69	62	56	50	45	41	37	33	30	27	2
0.058	126	125	121	115	108	100	92	84	77	70	63	57	52	47	42	38	34	31	28	2
0.065	120	119	116	111	105	98	91	84	77	70	64	58	53	48	43	39	36	32	29	2
0.073	115	114	111	107	102	96	90	83	77	71	65	59	54	49	45	40	37	33	30	2
0.080	110	109	107	104	99	94	88	82	76	71	65	60	55	50	46	41	38	34	31	2
0.088	106	106	104	101	97	92	87	81	76	70	65	60	55	51	46	42	39	35	32	2
0.095	103	102	100	98	94	90	85	80	75	70	65	60	56	51	47	43	40	36	33	3
0.103	99	99	97	95	92	88	84	79	75	70	65	60	56	52	48	44	40	37	34	3
0.110	96	96	94	92	90	86	82	78	74	69	65	61	56	52	48	44	41	38	35	3
0.118	94	93	92	90	88	84	81	77	73	69	65	60	56	52	49	45	42	38	35	3
0.125	91	91	90	88	86	83	80	76	72	68	64	60	56	53	49	45	42	39	36	3
0.133	89	88	87	86	84	81	78	75	71	68	64	60	56	53	49	46	43	39	36	3
0.140	87	86	85	84	82	80	77	74	71	67	64	60	56	53	49	46	43	40	37	3
0.148	85	84	84	82	80	78	76	73	70	66	63	60	56	53	50	46	43	40	37	3
0.155	83	82	82	81	79	77	74	72	69	66	63	59	56	53	50	47	44	41	38	3
0.163	81	81	80	79	77	76	73	71	68	65	62	59	56	53	50	47	44	41	38	3
0.170	79	79	79	77	76	74	72	70	67	65	62	59	56	53	50	47	44	41	39	3
0.178	78	78	77	76	75	73	71	69	66	64	61	58	56	53	50	47	44	41	39	3
0.185	76	76	76	75	73	72	70	68	66	63	61	58	55	52	50	47	44	42	39	3
0.193	75	75	74	73	72	71	69	67	65	63	60	58	55	52	50	47	44	42	39	3
0.200	74	74	73	72	71	70	68	66	64	62	60	57	55	52	50	47	44	42	39	3

RESULTS FOR USER DESIGNATED EXAMPLE a:\rerun\fec

INPUT IN MKS UNITS:

Fecal Coliform Distribution at a concentration of 59 MPN/100mL

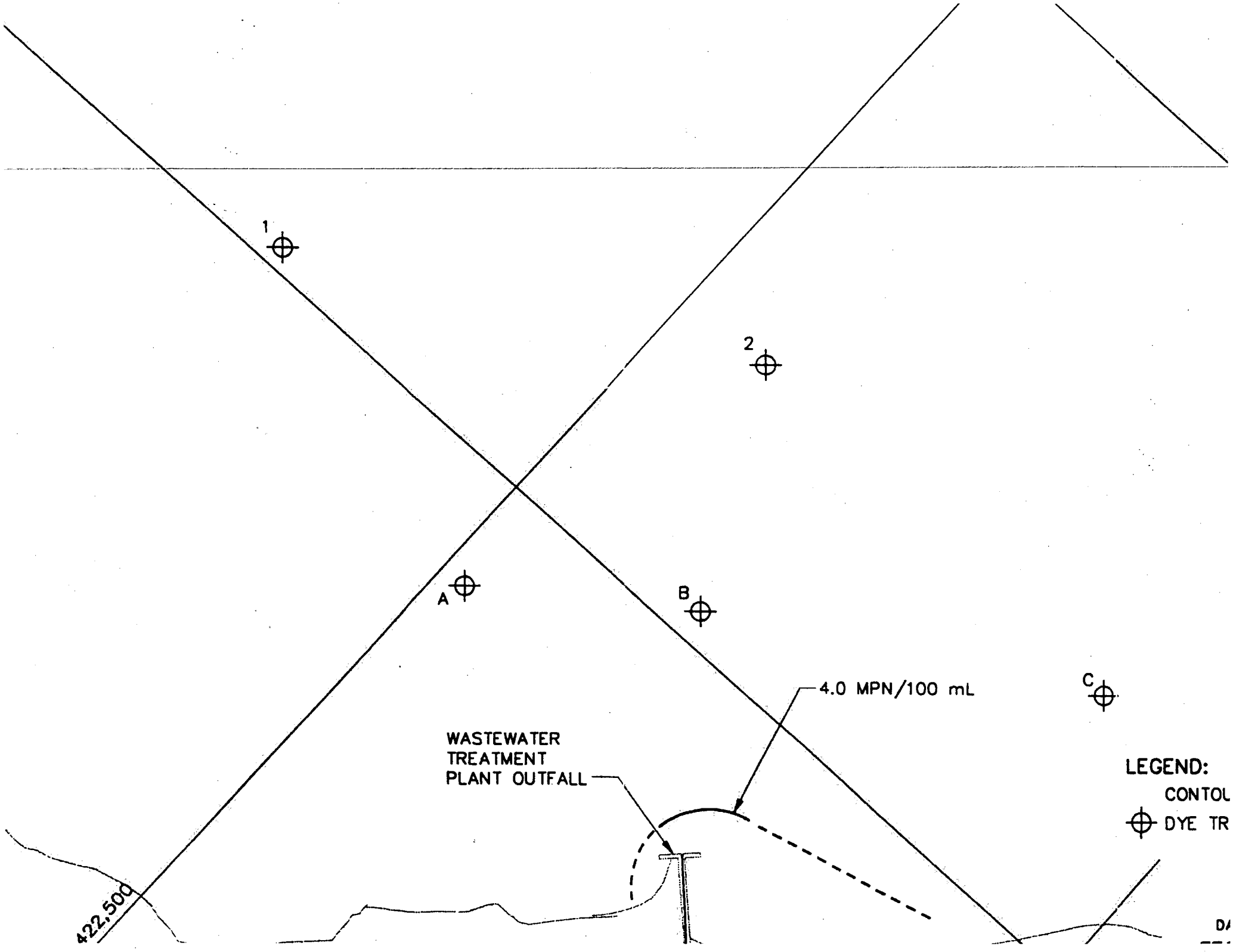
M	H	DX	DY	U	B	KD
0.194E+05	0.200E+01	0.210E+00	0.700E-01	0.400E-02	0.100E+04	0.100E-04

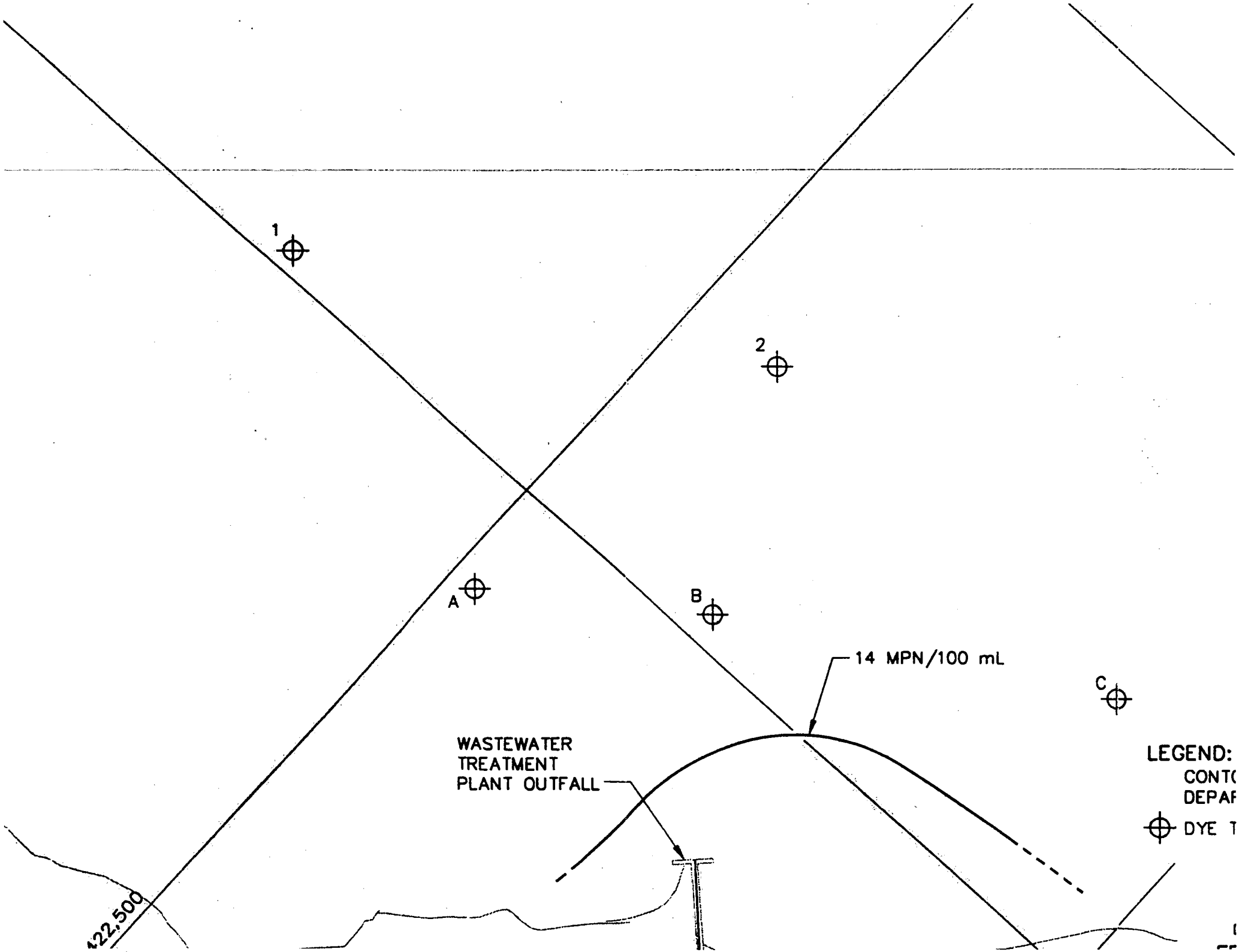
*** CONCENTRATION IN ORGANISMS PER 100 ML ***

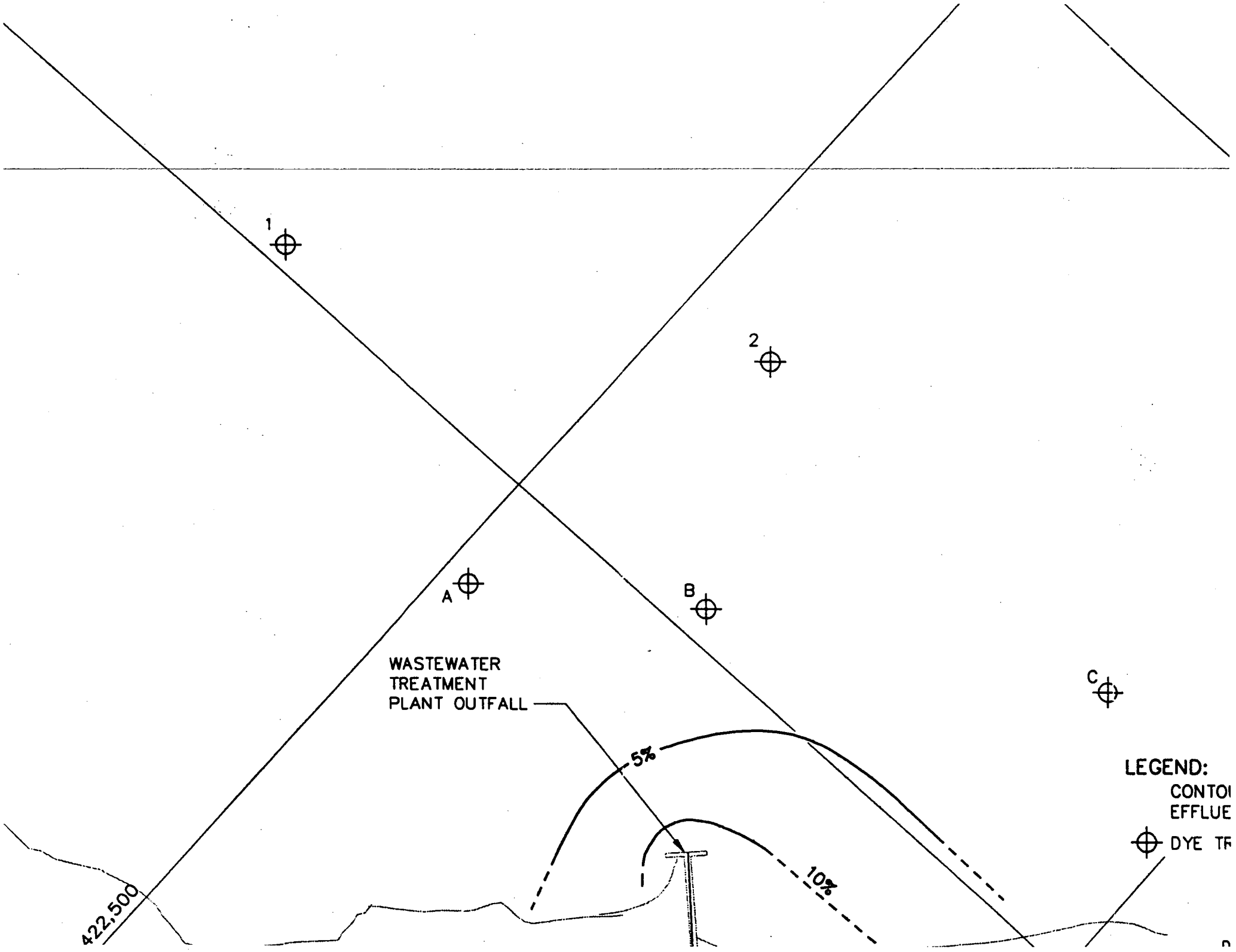
EVALUATION IS FROM -5 TO 5

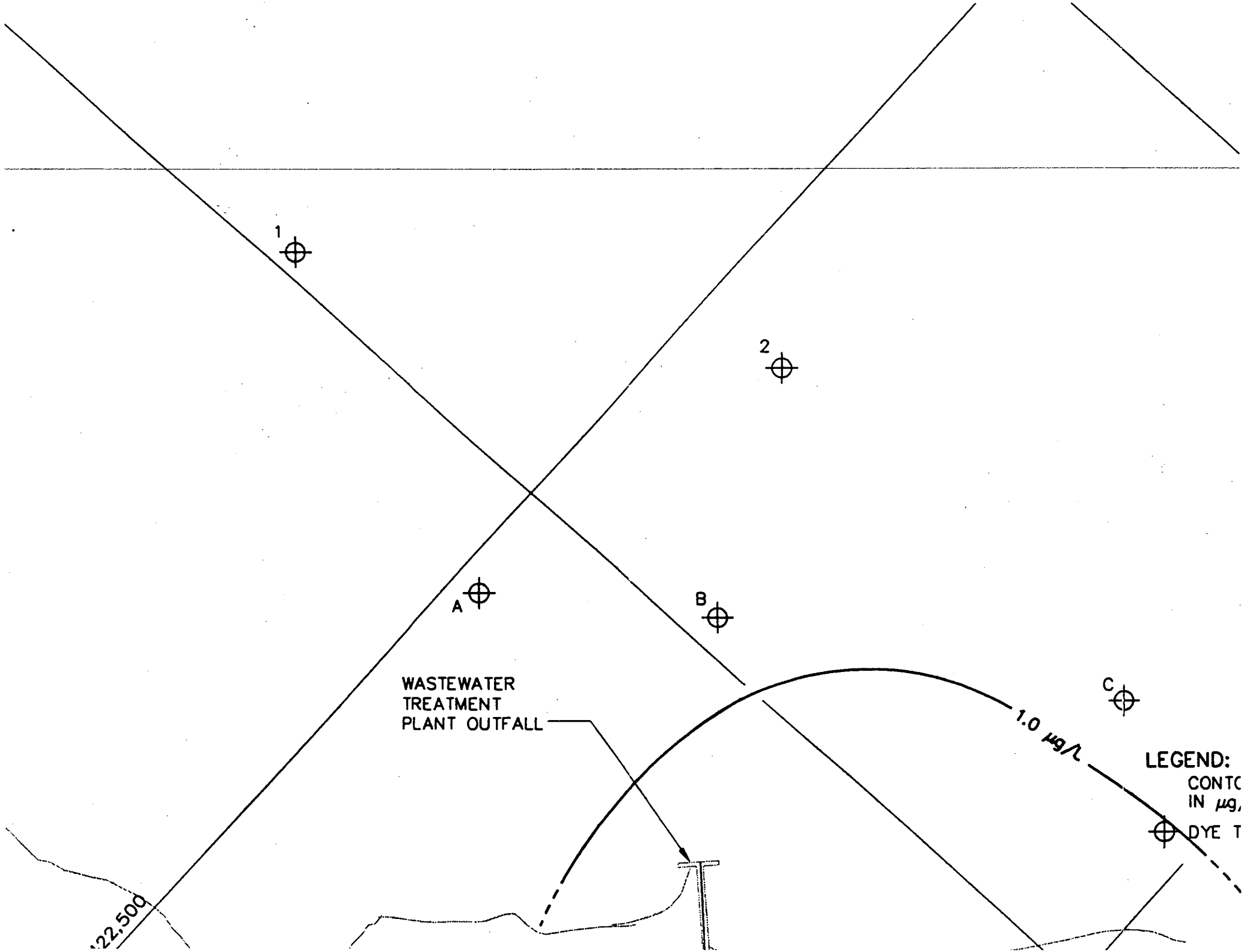
VALUES OF Y/B (COLUMNS) & X/B (ROWS):

	0.000	0.000	0.001	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.008	0.009	0.00
-0.010	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	3	3	
-0.009	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	3	
-0.009	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	3	
-0.008	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	
-0.008	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	
-0.007	6	6	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	
-0.007	6	6	6	6	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	
-0.007	6	6	6	6	6	6	5	5	5	5	5	5	4	4	4	4	4	4	4	
-0.006	6	6	6	6	6	6	6	5	5	5	5	5	5	4	4	4	4	4	4	
-0.005	6	6	6	6	6	6	6	5	5	5	5	5	5	4	4	4	4	4	4	
-0.005	7	7	7	6	6	6	6	6	5	5	5	5	5	5	4	4	4	4	4	
-0.005	7	7	7	7	6	6	6	6	5	5	5	5	5	5	4	4	4	4	4	
-0.004	7	7	7	7	7	6	6	6	6	5	5	5	5	5	4	4	4	4	4	
-0.004	8	8	7	7	7	7	6	6	6	5	5	5	5	5	5	4	4	4	4	
-0.003	8	8	8	7	7	7	6	6	6	6	5	5	5	5	5	4	4	4	4	
-0.003	9	8	8	8	7	7	6	6	6	6	5	5	5	5	5	4	4	4	4	
-0.002	9	9	8	8	7	7	7	6	6	6	5	5	5	5	5	4	4	4	4	
-0.002	10	10	9	8	8	7	7	6	6	6	6	5	5	5	5	5	4	4	4	
-0.001	11	10	9	8	8	7	7	6	6	6	6	5	5	5	5	5	4	4	4	
-0.001	13	11	10	9	8	7	7	6	6	6	6	5	5	5	5	5	4	4	4	
0.000	9999	11	10	9	8	7	7	7	6	6	6	5	5	5	5	5	4	4	4	
0.000	13	11	10	9	8	7	7	7	6	6	6	5	5	5	5	5	4	4	4	
0.001	11	11	9	9	8	7	7	7	6	6	6	5	5	5	5	5	5	4	4	
0.001	10	10	9	8	8	7	7	7	6	6	6	5	5	5	5	5	5	4	4	
0.002	10	9	9	8	8	7	7	7	6	6	6	5	5	5	5	5	5	4	4	
0.002	9	9	8	8	8	7	7	6	6	6	6	5	5	5	5	5	5	4	4	
0.003	9	8	8	8	7	7	7	6	6	6	6	5	5	5	5	5	5	4	4	
0.003	8	8	8	8	7	7	7	6	6	6	6	5	5	5	5	5	5	4	4	
0.004	8	8	8	7	7	7	7	6	6	6	6	5	5	5	5	5	5	4	4	
0.004	8	8	7	7	7	7	7	6	6	6	6	5	5	5	5	5	5	4	4	
0.005	7	7	7	7	7	7	6	6	6	6	6	5	5	5	5	5	5	4	4	
0.005	7	7	7	7	7	7	6	6	6	6	6	5	5	5	5	5	5	4	4	
0.006	7	7	7	7	7	6	6	6	6	6	5	5	5	5	5	5	5	4	4	
0.006	7	7	7	7	6	6	6	6	6	6	5	5	5	5	5	5	5	4	4	
0.007	7	7	7	6	6	6	6	6	6	6	5	5	5	5	5	5	5	4	4	
0.007	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	4	4	4	
0.008	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	4	4	4	
0.008	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	4	4	4	
0.009	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	4	4	4	
0.009	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	5	4	4	4	
0.010	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	5	4	4	4	


1
2
A
B
C
4.0 MPN/100 mL
WASTEWATER
TREATMENT
PLANT OUTFALL
LEGEND:
CONTOL
DYE TR
422,500

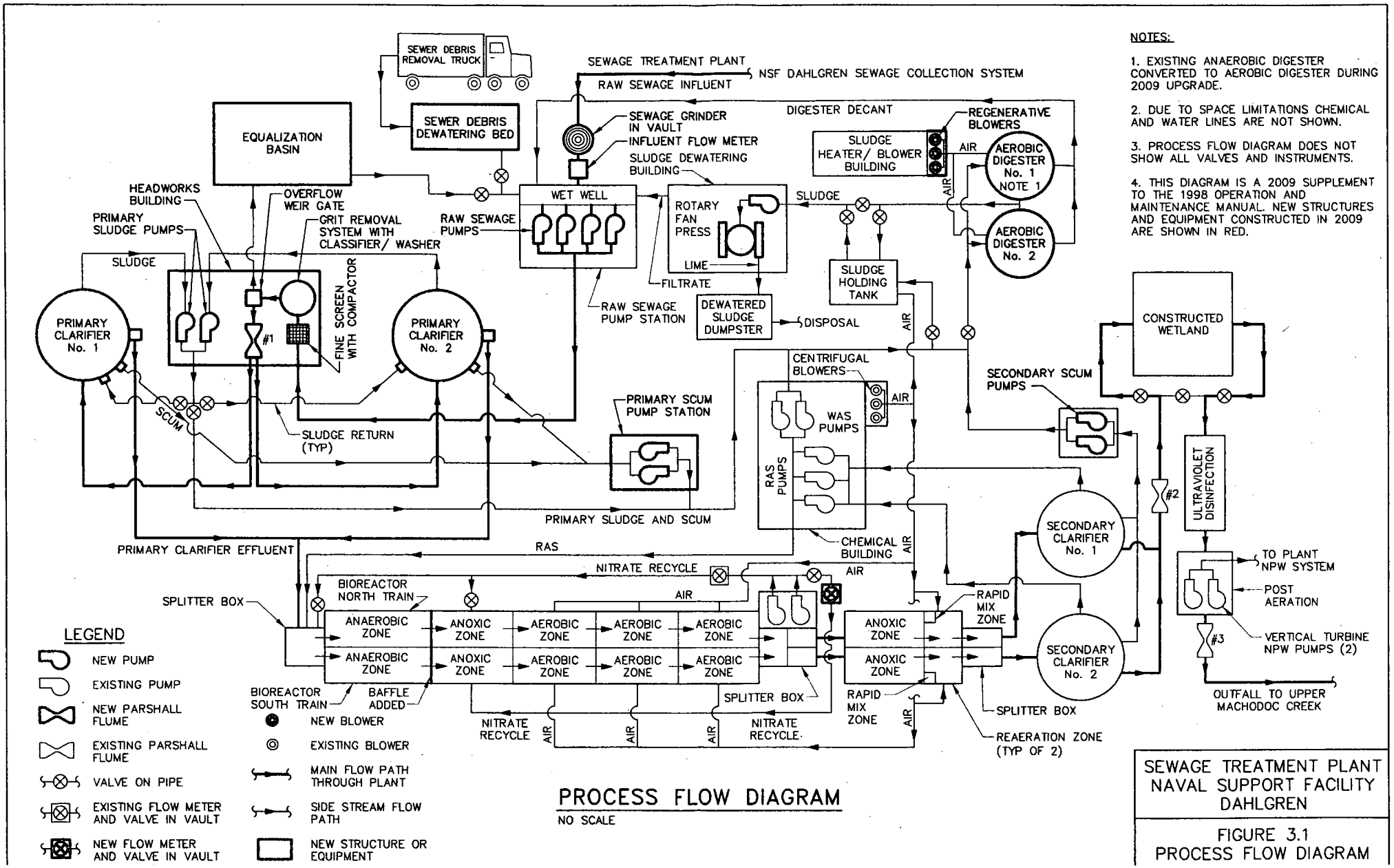

1
2
A
B
C
14 MPN/100 mL
WASTEWATER
TREATMENT
PLANT OUTFALL
LEGEND:
CONTO
DEPAR
DYE T
422,500


1
2
A
B
C
WASTEWATER
TREATMENT
PLANT OUTFALL
5%
10%
422,500
LEGEND:
CONTOU
EFFLUE
DYE TR


1
2
A
B
C
WASTEWATER
TREATMENT
PLANT OUTFALL
1.0 µg/l
LEGEND:
CONTC
IN µg/
DYE T
22,500

ATTACHMENT 2

Facility Schematic/Diagram



NOTES:

1. EXISTING ANAEROBIC DIGESTER CONVERTED TO AEROBIC DIGESTER DURING 2009 UPGRADE.
2. DUE TO SPACE LIMITATIONS CHEMICAL AND WATER LINES ARE NOT SHOWN.
3. PROCESS FLOW DIAGRAM DOES NOT SHOW ALL VALVES AND INSTRUMENTS.
4. THIS DIAGRAM IS A 2009 SUPPLEMENT TO THE 1998 OPERATION AND MAINTENANCE MANUAL. NEW STRUCTURES AND EQUIPMENT CONSTRUCTED IN 2009 ARE SHOWN IN RED.

PROCESS FLOW DIAGRAM

NO SCALE

SEWAGE TREATMENT PLANT
NAVAL SUPPORT FACILITY
DAHLGREN

FIGURE 3.1
PROCESS FLOW DIAGRAM

ATTACHMENT 3

Topographic Map

ATTACHMENT 4

Site Inspection Report Summary

Problems identified at last inspection: August 10, 2006

	Corrected	Not Corrected
1. Please review options for improved air distribution in the activated sludge basins.	**[X]**	**[ ]**
2. Please have staff properly trained on the new UV system, especially the monitoring systems	**[X]**	**[ ]**
3. Please expedite the incorporation of the equipment and operational changes in the IOP (interim operational plan).	**[X]**	**[ ]**
4. Plant is impacted by Inflow and Infiltration from rain storms. Most I/I can be handled by bringing additional equipment on-line. I&I reduction – Sanitary sewer and manhole lining project was finished one to one and a half years ago. An EQ basin was added to the plant as part of the 2009 upgrades.	**[X]**	**[ ]**

SUMMARY for CURRENT INSPECTION

Comments:

- **The Naval Base sanitary sewer collection system has 37 pump stations, 5 main ones. All are checked daily by utility shop personnel. STP operators are responsible for responding to pump station problems and SSOs.**
- **Primary clarifiers are being bypassed and are planned to be demolished.**

REQUEST for CORRECTIVE ACTION:

- **The stairs up to the (old) digester were overgrown with grass and other vegetation (photo 17), creating potentially unsafe conditions. Grass/plants should be cut back to provide clear access.**

Request for Information:

- **Documentation that the thermisters for the DO and pH meters and thermometers in use at the STP was requested as part of this inspection but has not yet been received. Submit a copy of documentation showing the date these items were verified against an NIST traceable thermometer, the temperature at which the check was conducted, and any correction factor to be applied. Please include the expiration date of the NIST traceable thermometer.**
- **Documentation of the Initial Demonstration of Laboratory Capability for DO was not available for review during this inspection. Please supply a copy of to DEQ.**

ATTACHMENT 5

Planning Statement

To:	Douglas Frasier
From:	Rebecca Shoemaker
Date:	13 November 2015
Subject:	Planning Statement for Naval Support Facility, Dahlgren
Permit Number:	VA0021067

Information for Outfall 001:

Discharge Type:	municipal, minor
Discharge Flow:	0.72 MGD design
Receiving Stream:	Upper Machodoc Creek
Latitude / Longitude:	38° 19' 15" / 77° 01' 40"
Rivermile:	1.84
Streamcode:	1a-UMC
Waterbody:	VAN-A30E
Water Quality Standards:	Class II, Section 2, special stds. a
Drainage Area:	51 square miles

1. Please provide water quality monitoring information for the receiving stream segment. If there is not monitoring information for the receiving stream segment, please provide information on the nearest downstream monitoring station, including how far downstream the monitoring station is from the outfall.

   This facility's outfall discharges into Upper Machodoc Creek.

   The following is the water quality summary for this segment of Upper Machodoc Creek, as taken from the 2014 Draft Integrated Report:

   Class II, Section 2, special stds. a.

   The aquatic life use is considered not supporting, however a TMDL has been completed for the Chesapeake Bay watershed. Assessment of the submerged aquatic vegetation (SAV) acreage and thirty day mean dissolved oxygen values during the summer season indicates that the shallow-water submerged aquatic vegetation and the open-water aquatic life subuses are not met. The seven day mean and instantaneous dissolved oxygen levels have not been assessed.

   The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory. A PCB TMDL for the tidal Potomac River watershed has been completed and approved.

   The recreation and wildlife uses were not assessed. The shellfishing use has been removed

2. Does this facility discharge to a stream segment on the 303(d) list? If yes, please fill out Table A.

Yes.

Table A. 303(d) Impairment and TMDL information for the receiving stream segment

Waterbody Name	Impaired Use	Cause	TMDL completed	WLA	Basis for WLA	TMDL Schedule
Impairment Information in the Draft 2014 Integrated Report						
Upper Machodoc Creek	Fish Consumption	PCBs	Tidal Potomac River Watershed PCBs TMDL 10/31/2007	0.064 grams/year PCB	0.064 ng/L PCB --- 0.72 MGD	---
	Aquatic Life	Aquatic Plants (Macrophytes)	Chesapeake Bay TMDL 12/29/2010	This facility is accounted for in the Chesapeake Bay TMDL. It is included in the NPDES Permit inventory (Table 9-4) and is part of an aggregated WLA for Total Nitrogen, Total Phosphorus, and Total Suspended Solids.		
		Dissolved Oxygen				
	Shallow-water Submerged Aquatic Vegetation	Aquatic Plants (Macrophytes)				
	Open-water Aquatic Life	Dissolved Oxygen				

3. Are there any downstream 303(d) listed impairments that are relevant to this discharge? If yes, please fill out Table B.

Yes.

Table B. Information on Downstream 303(d) Impairments and TMDLs

Waterbody Name	Impaired Use	Cause	TMDL completed	WLA	Basis for WLA	TMDL Schedule
Impairment Information in Maryland's 2014 Integrated Report						
Potomac River	Open-Water Fish and Shellfish	Total Nitrogen and Total Phosphorus	Chesapeake Bay TMDL 12/29/2010	This facility is accounted for in the Chesapeake Bay TMDL. It is included in the NPDES Permit inventory (Table 9-4) and is part of an aggregated WLA for Total Nitrogen, Total Phosphorus, and Total Suspended Solids.		
	Seasonal Migratory Fish Spawning and Nursery					
	Seasonal Deep-Water Fish and Shellfish					
	Seasonal Deep-Channel Refuge					
	Seasonal Shallow-Water Submerged Aquatic Vegetation	Total Suspended Solids				

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

   The tidal Potomac River is listed with a PCB impairment and a TMDL has been developed to address this impairment. This facility was included in the Tidal Potomac River PCB TMDL and received a WLA. This facility conducted PCB monitoring during the last permit cycle in support of the PCB TMDL. The PCB monitoring data will be evaluated, and source reductions through pollution minimization plans may be needed.

5. Fact Sheet Requirements – Please provide information regarding any drinking water intakes located within a 5 mile radius of the discharge point.

   There are no public water supply intakes located within five miles of this discharge.

ATTACHMENT 6

Dissolved Oxygen Criteria for Class II Water
9VAC25-260-185

Dissolved Oxygen Criteria (9VAC25-260-185)

Designated Use	Criteria Concentration/Duration	Temporal Application
Migratory fish spawning and nursery	7-day mean > 6 mg/L (tidal habitats with 0-0.5 ppt salinity)	February 1 – May 31
	Instantaneous minimum > 5 mg/L	
Open-water[1,2]	30-day mean > 5.5 mg/L (tidal habitats with 0-0.5 ppt salinity) 30-day mean > 5 mg/L (tidal habitats with >0.5 ppt salinity)	Year-round
	7-day mean > 4 mg/L	
	Instantaneous minimum > 3.2 mg/L at temperatures < 29°C Instantaneous minimum > 4.3 mg/L at temperatures > 29°C	
Deep-water	30-day mean >3 mg/L	June 1-September 30
	1-day mean > 2.3 mg/L	
	Instantaneous minimum > 1.7 mg/L	
Deep-channel	Instantaneous minimum > 1 mg/L	June 1-September 30

[1]See subsection aa of 9VAC25-260-310 for site specific seasonal open-water dissolved oxygen criteria applicable to the tidal Mattaponi and Pamunkey Rivers and their tidal tributaries.

[2]In applying this open-water instantaneous criterion to the Chesapeake Bay and its tidal tributaries where the existing water quality for dissolved oxygen exceeds an instantaneous minimum of 3.2 mg/L, that higher water quality for dissolved oxygen shall be provided antidegradation protection in accordance with section 30 subsection A.2 of the Water Quality Standards.

ATTACHMENT 7

Water Quality Criteria / Wasteload Allocation Analysis

SALTWATER AND TRANSITION ZONES
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Naval Support Facility Dahlgren WWTP Permit No.: VA0021067 Version: OWP Guidance Memo 00-2011 (8/24/00)
Receiving Stream: Upper Machodoc Creek

Stream Information

Mean Hardness (as CaCO3) =	833	mg/l
90th % Temperature (Annual) =	29	(° C)
90th % Temperature (Winter) =	18.4	(° C)
90th % Maximum pH =	7.9	
10th % Maximum pH =	6.5	
Tier Designation (1 or 2) =	1	
Early Life Stages Present Y/N =	Y	
Tidal Zone =	2	(1 = saltwater, 2 = transition zone)
Mean Salinity =	10	(g/kg)

Mixing Information

Design Flow (MGD)	0.72
Acute WLA multiplier	10
Chronic WLA multiplier	20
Human health WLA multiplier	

Effluent Information

Mean Hardness (as CaCO3) =	50	mg/L
90 % Temperature (Annual) =	25	(° C)
90 % Temperature (Winter) =	15	(° C)
90 % Maximum pH =	8	SU
10 % Maximum pH =	6.9	SU
Discharge Flow =	0.72	MGD

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Acenapthene	0	--	--	9.9E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Acrolein	0	--	--	9.3E+00	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Acrylonitrile [C]	0	--	--	2.5E+00	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Aldrin [C]	0	1.3E+00	--	5.0E-04	1.3E+01	--	0.0E+00	--	--	--	--	--	--	1.3E+01	--	0.0E+00
Ammonia-N (mg/l) - Annual	0	3.55E+00	5.33E-01	--	3.55E+01	1.07E+01	--	--	--	--	--	--	--	3.55E+01	1.07E+01	--
Ammonia-N (mg/l) - Winter	0	7.57E+00	1.14E+00	--	7.57E+01	2.28E+01	--	--	--	--	--	--	--	7.57E+01	2.28E+01	--
Anthracene	0	--	--	4.0E+04	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Antimony	0	--	--	6.4E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Arsenic	0	6.9E+01	3.6E+01	--	6.9E+02	7.2E+02	--	--	--	--	--	--	--	6.9E+02	7.2E+02	--
Benzene [C]	0	--	--	5.1E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Benzidine [C]	0	--	--	2.0E-03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Benzo (a) anthracene [C]	0	--	--	1.8E-01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Benzo (b) fluoranthene [C]	0	--	--	1.8E-01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Benzo (k) fluoranthene [C]	0	--	--	1.8E-01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Benzo (a) pyrene [C]	0	--	--	1.8E-01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Bis2-Chloroethyl Ether [C]	0	--	--	5.3E+00	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Bis2-Chloroisopropyl Ether	0	--	--	6.5E+04	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Bis2-Ethylhexyl Phthalate [C]	0	--	--	2.2E+01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Bromoform [C]	0	--	--	1.4E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Butylbenzylphthalate	0	--	--	1.9E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Cadmium	0	1.9E+01	3.4E+00	--	1.9E+02	6.7E+01	--	--	--	--	--	--	--	1.9E+02	6.7E+01	--
Carbon Tetrachloride [C]	0	--	--	1.6E+01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Chlordane [C]	0	9.0E-02	4.0E-03	8.1E-03	9.0E-01	8.0E-02	0.0E+00	--	--	--	--	--	--	9.0E-01	8.0E-02	0.0E+00

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
TRC	0	1.9E+01	1.1E+01	--	1.9E+02	2.2E+02	--	--	--	--	--	--	--	1.9E+02	2.2E+02	--
Chlorine Prod. Oxidant	0	1.3E+01	7.5E+00	--	1.3E+02	1.5E+02	--	--	--	--	--	--	--	1.3E+02	1.5E+02	--
Chlorobenzene		--	--	1.6E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Chlorodibromomethane [C]	0	--	--	1.3E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Chloroform	0	--	--	1.1E+04	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
2-Chloronaphthalene	0	--	--	1.6E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
2-Chlorophenol	0	--	--	1.5E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Chlorpyrifos	0	1.1E-02	5.6E-03	--	1.1E-01	1.1E-01	--	--	--	--	--	--	--	1.1E-01	1.1E-01	--
Chromium III	0	1.8E+03	2.3E+02	--	1.8E+04	4.6E+03	--	--	--	--	--	--	--	1.8E+04	4.6E+03	--
Chromium VI	0	1.6E+01	1.1E+01	--	1.6E+02	2.2E+02	--	--	--	--	--	--	--	1.6E+02	2.2E+02	--
Chrysene [C]	0	--	--	1.8E-02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Copper	0	9.3E+00	6.0E+00	--	9.3E+01	1.2E+02	--	--	--	--	--	--	--	9.3E+01	1.2E+02	--
Cyanide, Free	0	1.0E+00	1.0E+00	1.6E+04	1.0E+01	2.0E+01	0.0E+00	--	--	--	--	--	--	1.0E+01	2.0E+01	0.0E+00
DDD [C]	0	--	--	3.1E-03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
DDE [C]	0	--	--	2.2E-03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
DDT [C]	0	1.3E-01	1.0E-03	2.2E-03	1.3E+00	2.0E-02	0.0E+00	--	--	--	--	--	--	1.3E+00	2.0E-02	0.0E+00
Demeton	0	--	1.0E-01	--	--	2.0E+00	--	--	--	--	--	--	--	--	2.0E+00	--
Diazinon	0	1.7E-01	1.7E-01	--	1.7E+00	3.4E+00	--	--	--	--	--	--	--	1.7E+00	3.4E+00	--
Dibenz(a,h)anthracene [C]	0	--	--	1.8E-01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
1,2-Dichlorobenzene	0	--	--	1.3E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
1,3-Dichlorobenzene	0	--	--	9.6E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
1,4-Dichlorobenzene	0	--	--	1.9E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
3,3-Dichlorobenzidine [C]	0	--	--	2.8E-01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Dichlorobromomethane [C]	0	--	--	1.7E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
1,2-Dichloroethane [C]	0	--	--	3.7E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
1,1-Dichloroethylene	0	--	--	7.1E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
1,2-trans-dichloroethylene	0	--	--	1.0E+04	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
2,4-Dichlorophenol	0	--	--	2.9E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
1,2-Dichloropropane [C]	0	--	--	1.5E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
1,3-Dichloropropene [C]	0	--	--	2.1E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Dieldrin [C]	0	7.1E-01	1.9E-03	5.4E-04	7.1E+00	3.8E-02	0.0E+00	--	--	--	--	--	--	7.1E+00	3.8E-02	0.0E+00
Diethyl Phthalate	0	--	--	4.4E+04	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
2,4-Dimethylphenol	0	--	--	8.5E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Dimethyl Phthalate	0	--	--	1.1E+06	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Di-n-Butyl Phthalate	0	--	--	4.5E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
2,4 Dinitrophenol	0	--	--	5.3E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
2-Methyl-4,6-Dinitrophenol	0	--	--	2.8E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
2,4-Dinitrotoluene [C]	0	--	--	3.4E+01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.1E-08	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
1,2-Diphenylhydrazine [C]	0	--	--	2.0E+00	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Alpha-Endosulfan	0	3.4E-02	8.7E-03	8.9E+01	3.4E-01	1.7E-01	0.0E+00	--	--	--	--	--	--	3.4E-01	1.7E-01	0.0E+00

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Beta-Endosulfan	0	3.4E-02	8.7E-03	8.9E+01	3.4E-01	1.7E-01	0.0E+00	--	--	--	--	--	--	3.4E-01	1.7E-01	0.0E+00
Alpha + Beta Endosulfan	0	3.4E-02	8.7E-03	--	3.4E-01	1.7E-01	--	--	--	--	--	--	--	3.4E-01	1.7E-01	--
Endosulfan Sulfate	0	--	--	8.9E+01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Endrin	0	3.7E-02	2.3E-03	6.0E-02	3.7E-01	4.6E-02	0.0E+00	--	--	--	--	--	--	3.7E-01	4.6E-02	0.0E+00
Endrin Aldehyde	0	--	--	3.0E-01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Ethylbenzene	0	--	--	2.1E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Fluoranthene	0	--	--	1.4E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Fluorene	0	--	--	5.3E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Guthion	0	--	1.0E-02	--	--	2.0E-01	--	--	--	--	--	--	--	--	2.0E-01	--
Heptachlor [C]	0	5.3E-02	3.6E-03	7.9E-04	5.3E-01	7.2E-02	0.0E+00	--	--	--	--	--	--	5.3E-01	7.2E-02	0.0E+00
Heptachlor Epoxide [C]	0	5.3E-02	3.6E-03	3.9E-04	5.3E-01	7.2E-02	0.0E+00	--	--	--	--	--	--	5.3E-01	7.2E-02	0.0E+00
Hexachlorobenzene [C]	0	--	--	2.9E-03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Hexachlorobutadiene [C]	0	--	--	1.8E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Hexachlorocyclohexane Alpha-BHC [C]	0	--	--	4.9E-02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Hexachlorocyclohexane Beta-BHC [C]	0	--	--	1.7E-01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Hexachlorocyclohexane Gamma-BHC [C] (Lindane)	0	1.6E-01	--	1.8E+00	1.6E+00	--	0.0E+00	--	--	--	--	--	--	1.6E+00	--	0.0E+00
Hexachlorocyclopentadiene	0	--	--	1.1E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Hexachloroethane [C]	0	--	--	3.3E+01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Hydrogen Sulfide	0	--	2.0E+00	--	--	4.0E+01	--	--	--	--	--	--	--	--	4.0E+01	--
Indeno (1,2,3-cd) pyrene C	0	--	--	1.8E-01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Isophorone [C]	0	--	--	9.6E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Kepone	0	--	0.0E+00	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00	--
Lead	0	2.4E+02	9.3E+00	--	2.4E+03	1.9E+02	--	--	--	--	--	--	--	2.4E+03	1.9E+02	--
Malathion	0	--	1.0E-01	--	--	2.0E+00	--	--	--	--	--	--	--	--	2.0E+00	--
Mercury	0	1.8E+00	9.4E-01	--	1.8E+01	1.9E+01	--	--	--	--	--	--	--	1.8E+01	1.9E+01	--
Methyl Bromide	0	--	--	1.5E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Methylene Chloride [C]	0	--	--	5.9E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Methoxychlor	0	--	3.0E-02	--	--	6.0E-01	--	--	--	--	--	--	--	--	6.0E-01	--
Mirex	0	--	0.0E+00	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00	--
Nickel	0	7.4E+01	8.2E+00	4.6E+03	7.4E+02	1.6E+02	0.0E+00	--	--	--	--	--	--	7.4E+02	1.6E+02	0.0E+00
Nitrobenzene	0	--	--	6.9E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
N-Nitrosodimethylamine [C]	0	--	--	3.0E+01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
N-Nitrosodiphenylamine [C]	0	--	--	6.0E+01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
N-Nitrosodi-n-propylamine [C]	0	--	--	5.1E+00	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Nonylphenol	0	7.0E+00	1.7E+00	--	7.0E+01	3.4E+01	--	--	--	--	--	--	--	7.0E+01	3.4E+01	--
Parathion	0	6.5E-02	1.3E-02	--	6.5E-01	2.6E-01	--	--	--	--	--	--	--	6.5E-01	2.6E-01	--
PCB Total [C]	0	--	1.4E-01	6.4E-04	--	2.8E+00	0.0E+00	--	--	--	--	--	--	--	2.8E+00	0.0E+00
Pentachlorophenol [C]	0	5.4E+00	4.1E+00	3.0E+01	5.4E+01	8.2E+01	0.0E+00	--	--	--	--	--	--	5.4E+01	8.2E+01	0.0E+00

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Phenol	0	--	--	8.6E+05	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Phosphorus (Elemental)	0	--	1.0E-01	--	--	2.0E+00	--	--	--	--	--	--	--	--	2.0E+00	--
Pyrene	0	--	--	4.0E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Selenium	0	2.0E+01	5.0E+00	4.2E+03	2.0E+02	1.0E+02	0.0E+00	--	--	--	--	--	--	2.0E+02	1.0E+02	0.0E+00
Silver	0	1.9E+00	--	--	1.9E+01	--	--	--	--	--	--	--	--	1.9E+01	--	--
1,1,2,2-Tetrachloroethane [C]	0	--	--	4.0E+01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Tetrachloroethylene [C]	0	--	--	3.3E+01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Thallium	0	--	--	4.7E-01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Toluene	0	--	--	6.0E+03	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Toxaphene [C]	0	2.1E-01	2.0E-04	2.8E-03	2.1E+00	4.0E-03	0.0E+00	--	--	--	--	--	--	2.1E+00	4.0E-03	0.0E+00
Tributyltin	0	4.2E-01	7.4E-03	--	4.2E+00	1.5E-01	--	--	--	--	--	--	--	4.2E+00	1.5E-01	--
1,2,4-Trichlorobenzene	0	--	--	7.0E+01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
1,1,2-Trichloroethane [C]	0	--	--	1.6E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Trichloroethylene [C]	0	--	--	3.0E+02	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
2,4,6-Trichlorophenol [C]	0	--	--	2.4E+01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Vinyl Chloride [C]	0	--	--	2.4E+01	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00
Zinc	0	9.0E+01	8.1E+01	2.6E+04	9.0E+02	1.6E+03	0.0E+00	--	--	--	--	--	--	9.0E+02	1.6E+03	0.0E+00

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. For transition zone waters, spreadsheet prints the lesser of the freshwater and saltwater water quality criteria.
6. Regular WLA = (WQC x WLA multiplier) - (WLA multiplier - 1)(background conc.)
7. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
8. Antideg. WLA = (Antideg. Baseline)(WLA multiplier) - (WLA multiplier - 1)(background conc.)

Metal	Site Specific Target Value (SSTV)
Antimony	0.0E+00
Arsenic III	2.8E+02
Cadmium	4.0E+01
Chromium III	2.8E+03
Chromium VI	6.4E+01
Copper	3.7E+01
Lead	1.1E+02
Mercury	7.2E+00
Nickel	0.0E+00
Selenium	0.0E+00
Silver	7.6E+00
Zinc	0.0E+00

Note: do not use QL's lower than the minimum QL's provided in agency guidance

ATTACHMENT 8

January 1990 to February 2011
Calculated
Ambient pH, Temperature, Hardness data

Field Parameter and Hardness Percentiles for the Northern Region by 8-Digit HUC and Watershed

Calculations based on available data from the period 1-1-1990 to 2-28-2011

*Wet Season refers to December - April.

HUC/Watershed Code	90% Temperature (°C) Annual	90% Temperature (°C) Wet Season	90% Max pH (SU) Annual	10% Max pH (SU) Annual	90% Max pH (SU) Wet Season	10% Max pH (SU) Wet Season	Average Hardness
8-Digit HUC							
02070008	23.2	13.7	7.9	7.0	8.1	6.9	69.1
02070010	27.1	15.0	8.4	7.0	8.1	6.9	91.4
02070011	28.1	15.7	8.2	6.5	8.0	6.3	210.7
02080103	23.8	14.4	7.8	6.8	7.9	6.8	34.2
02080104	27.8	14.5	7.5	6.5	7.5	6.5	35.5
02080105	23.6	15.3	7.1	5.9	7.1	5.8	22.3
02080106	23.9	14.3	7.5	6.4	7.6	6.4	39.8
Potomac River Basin							
VAN-A01R	23.3	11.0	8.0	7.1	8.4	7.1	35.4
VAN-A02R	23.1	12.7	7.8	7.0	8.0	7.0	63.8
VAN-A03R	22.0	13.5	8.1	7.3	8.2	7.4	108.1
VAN-A04R	22.2	13.4	7.8	6.8	8.0	6.8	53.9
VAN-A05R	23.0	13.8	8.0	6.9	8.3	6.9	43.0
VAN-A06R	24.2	12.9	8	7.1	8.5	7.07	63.3
VAN-A07R	21.3	14.2	7.8	6.9	7.8	6.9	62.9
VAN-A08R	23.4	12.7	8.0	7.0	8.0	7.0	83.6
VAN-A09R	25.5	15.4	7.9	7.1	8.1	7.0	120.7
VAN-A10R	22.1	14.4	7.6	7.2	8.0	7.2	102.8
VAN-A11R	22.9	16.2	7.5	6.8	7.6	6.8	46.8
VAN-A12E (Four Mile Run)	27.1	15.1	8.3	6.9	8.3	7.0	125.9
VAN-12R	24.0	13.3	8.5	7.1	8.3	7.1	83.7
VAN-A13E (Hunting Creek)	26.6	14.5	7.6	6.9	7.5	6.9	101.2
VAN-A13R	26.4	14.3	8.1	7.1	7.8	7.1	64.0
VAN-A14E (Dogue, Little Hunting Creeks)	28.4	14.3	8.6	7.2	8.3	7.0	109.9
VAN-A14R	21.4	10.1	7.3	6.5	7.3	6.6	55.3
VAN-A15E (Pohick Creek)	28.6	16.4	8.8	7.1	8.1	6.9	91.1
VAN-A15R	23.8	14.0	7.6	6.8	7.6	6.7	60.1
VAN-A16R	23.1	11.3	7.5	6.7	7.6	6.7	38.9
VAN-A17R	24.0	13.5	7.9	7.0	8.1	7.1	61.0
VAN-A18R	24.7	13.1	7.8	6.9	7.9	7.0	63.7

HUC/Watershed Code	90% Temperature (°C) Annual	90% Temperature (°C) Wet Season	90% Max pH (SU) Annual	10% Max pH (SU) Annual	90% Max pH (SU) Wet Season	10% Max pH (SU) Wet Season	Average Hardness
VAN-A19R	24.0	12.7	7.9	6.9	8.0	7.0	99.1
VAN-A20R	27.1	16.1	8.0	6.9	7.6	6.9	62.1
VAN-A21R	23.9	12.1	8.0	7.2	8.2	7.4	60.6
VAN-A22R	23.9	15.0	8.0	7.3	8.2	7.4	141.9
VAN-A23R	24.5	15.2	7.9	7.0	8.1	6.9	113.2
VAN-A24R	23.0	14.7	8.0	6.8	8.0	6.9	51.9
VAN-A25E (Neabsco Creek, Occoquan River)	28.7	16.1	8.6	7.1	8.4	7.2	105.9
VAN-A25R	23.0	17.1	7.6	6.7	7.7	6.7	90.8
VAN-A26E (Chopawamsic, Quantico Creeks)	28.2	17.5	8.2	6.7	8.1	6.7	46.5
VAN-A26R	23.5	13.5	7.4	6.5	7.4	6.4	40.1
VANA27R	23.3	12.6	7.9	6.8	7.8	6.5	39.9
VAN-A28E (Aquia Creek)	28.8	18.3	8.5	7.1	8.1	6.9	259.7
VAN-A28R	25.6	15.0	7.6	7.0	7.3	6.9	88.3
VAN-A29E (Potomac Creek)	29.0	16.6	8.7	7.2	8.5	7.2	241.3
VAN-A29R	22.8	13.7	7.4	6.1	7.3	5.9	35.9
VAN-A30E (Upper Machodoc, Williams Creeks)	29.0	18.4	7.9	6.5	7.7	6.0	833.6
VAN-A30R	24.1	17.2	7.2	5.9	7.4	5.8	31.9
Rappahannock River Basin							
VAN-E01R	23.0	12.0	7.7	6.9	7.9	7.0	34.7
VAN-E02R	22.6	13.0	7.6	6.8	7.8	6.9	44.6
VAN-E03R	23.4	13.8	7.8	6.7	8.0	6.5	12.6
VAN-E04R	24.2	14.0	7.7	6.7	7.9	6.7	14.2
VAN-E05R	23.2	13.9	7.8	7.0	7.9	6.9	24.0
VAN-E06R	23.8	14.9	7.9	6.8	7.7	6.8	28.4
VAN-E07R	23.0	16.4	7.5	6.6	7.8	6.7	28.3
VAN-E08R	24.8	14.7	7.6	6.9	7.6	6.9	80.0
VAN-E09R	24.9	18.0	7.6	6.8	7.9	6.9	62.0
VAN-E10R	22.7	13.6	7.5	6.5	8.0	6.5	26.6
VAN-E11R	22.7	15.6	7.9	6.8	7.9	6.8	15.6
VAN-E12R	26.0	14.2	7.9	6.9	7.8	6.9	19.0
VAN-E13R	24.6	13.8	7.6	6.9	7.6	7.0	29.5
VAN-E14R	22.5	14.6	8.1	6.5	8.0	6.7	15.0
VAN-E15R	24.0	13.4	7.6	6.7	7.5	6.7	23.0
VAN-E16R	25.7	15.4	8.0	6.7	8.0	6.7	101.6
VAN-E17R	22.6	12.2	7.7	6.7	8.0	6.7	44.0

HUC/Watershed Code	90% Temperature (°C) Annual	90% Temperature (°C) Wet Season	90% Max pH (SU) Annual	10% Max pH (SU) Annual	90% Max pH (SU) Wet Season	10% Max pH (SU) Wet Season	Average Hardness
VAN-E18R	25.3	15.7	8.0	6.8	7.8	6.8	27.1
VAN-E19R	26.7	13.1	8.0	6.5	7.6	6.5	27.7
AN-E20E (Rappahannock River - Fredericksburg)	27.3	15.8	7.8	7.0	7.7	7.0	28.9
VAN-E20R	23.4	14.8	7.2	6.2	7.3	6.5	44.2
VAN-E21E (Lower Rappahannock River)	28.2	14.6	7.4	6.6	7.4	6.6	36.5
VAN-E21R	24.1	12.3	6.9	5.4	7.1	5.4	24.8
York River Basin							
VAN-F01R	22.5	14.5	7.7	6.8	7.7	6.8	43.7
VAN-F02R	24.0	12.6	7.5	6.7	7.7	6.6	28.9
VAN-F03R	23.5	13.7	7.4	6.5	7.5	6.5	25.6
VAN-F06R	22.9	13.4	7.5	6.5	7.4	6.6	23.5
VAN-F07R	23.0	12.1	7.5	6.5	7.6	6.7	31.1
VAN-F08R	29.0	19.0	7.3	3.4	7.2	3.7	109.1
VAN-F10R	23.8	10.1	7.4	6.3	7.3	6.5	21.5
VAN-F15R	23.0	15.8	7.3	6.3	7.3	6.0	34.9
VAN-F16R	23.0	15.0	7.3	6.4	7.4	6.2	19.6
VAN-F17R	24.5	16.2	7.2	6.1	7.2	6.1	22.8
VAN-F18R	23.1	15.9	7.2	6.2	7.0	6.1	29.0
VAN-F19R	23.7	14.4	7.2	6.1	7.0	6.1	31.8
VAN-F20R	23.4	14.1	7.2	5.9	7.3	5.8	31.3
VAN-F21R	23.7	14.8	7.0	5.7	7.0	5.6	18.7
VAN-F22R	24.0	14.8	6.9	5.8	6.7	5.8	19.0

ATTACHMENT 9

Salinity Data Recorded
at
DEQ Monitoring Station 1AUMC004.43

Monitoring Station ID 1AUMC004.43

Stream Name	Collection Date Time	Collector Id	Depth	Temp Celcius	Field Ph	Do Probe	Specific Conductance	Salinity
UPPER MACHODOC CREEK	7-Jan-99	JPW	0.3	0.1	7.1	12.9	11212	6.4
UPPER MACHODOC CREEK	17-Mar-99	JST	0.3	7.3	6.9	10.8	2278	NULL
UPPER MACHODOC CREEK	25-May-99	JST	1	NULL	NULL	NULL	NULL	NULL
UPPER MACHODOC CREEK	25-May-99	JST	0.3	22.2	6.6	6.6	10440	5.9
UPPER MACHODOC CREEK	25-Aug-99	JST	0.3	26.6	6.8	5.1	20912	12.5
UPPER MACHODOC CREEK	5-Oct-99	JST	0.3	18.8	6.9	5.3	9037	5.1
UPPER MACHODOC CREEK	2-Dec-99	JPW	3	NULL	NULL	NULL	NULL	NULL
UPPER MACHODOC CREEK	2-Dec-99	JPW	0.3	0.7	5.7	11.4	58.1	NULL
UPPER MACHODOC CREEK	23-Feb-00	JPW	0.3	6.2	NULL	11	83.4	NULL
UPPER MACHODOC CREEK	26-Apr-00	JPW	0.3	10.3	NULL	10.9	87.5	NULL
UPPER MACHODOC CREEK	28-Jun-00	JPW	0.3	22.18	6.68	6.44	77.5	NULL
UPPER MACHODOC CREEK	29-Aug-00	JPW	0.3	21.85	6.74	4.02	144.2	NULL
UPPER MACHODOC CREEK	26-Oct-00	JPW	0.3	12.06	5.72	4.41	36.9	NULL
UPPER MACHODOC CREEK	14-Feb-01	JPW	0.3	NULL	NULL	NULL	NULL	NULL
UPPER MACHODOC CREEK	13-Mar-01	JPW	0.3	10.14	6.65	9.09	156.3	NULL
UPPER MACHODOC CREEK	3-May-01	JPW	0.3	18.57	7.15	7.6	140.2	NULL
UPPER MACHODOC CREEK	20-Dec-01	JPW	0.3	3.93	6.89	8.71	41.8	NULL
UPPER MACHODOC CREEK	7-Feb-02	JPW	0.3	2.81	6.91	10.3	47.4	NULL
UPPER MACHODOC CREEK	15-Apr-02	JPW	0.3	22.08	6.14	7.52	34.9	NULL
UPPER MACHODOC CREEK	6-Feb-03	MLM	0.3	2.28	6.06	15.27	402.2	NULL
UPPER MACHODOC CREEK	2-Apr-03	DJD	0.3	13.3	7.4	7.48	542.5	NULL
UPPER MACHODOC CREEK	10-Jun-03	DJD	0.3	23.82	6.54	4.29	294.4	NULL
UPPER MACHODOC CREEK	13-Aug-03	MLM	0.3	27.44	6.83	4.18	258.8	NULL
UPPER MACHODOC CREEK	9-Dec-03	MLM	0.3	2.15	6.84	13.11	454.1	NULL
UPPER MACHODOC CREEK	5-Feb-04	MLM	0.3	NULL	NULL	NULL	NULL	NULL
UPPER MACHODOC CREEK	23-Jun-04	MLM	0.3	26.47	7.42	5.65	41.4	NULL
UPPER MACHODOC CREEK	31-Aug-04	MLM	0.3	27.66	7.42	5.25	125.6	NULL
UPPER MACHODOC CREEK	12-Oct-04	JMC	0.3	18.35	7.03	8.36	4112	NULL
UPPER MACHODOC CREEK	20-Dec-04	MLM	0.3	0.43	5.98	13.45	64.5	NULL
UPPER MACHODOC CREEK	8-Feb-05	MLM	0.3	5.33	7.07	13.74	149.1	NULL
UPPER MACHODOC CREEK	14-Apr-05	MLM	0.3	15.09	7.04	7.22	193.6	NULL
UPPER MACHODOC CREEK	2-Jun-05	JMC	0.3	23.67	6.9	5.92	3951	2.15
UPPER MACHODOC CREEK	10-Aug-05	GKB	0.3	31.11	6.94	6.74	9870	NULL

UPPER MACHODOC CREEK	25-Oct-05	GKB	0.3	13.4	6.93	8.97	11808	NULL
UPPER MACHODOC CREEK	5-Dec-05	MLM	0.3	6.4	7.48	11.56	376.5	NULL
UPPER MACHODOC CREEK	1-Feb-06	MLM	0.3	13.65	7.44	8.95	138.4	NULL
UPPER MACHODOC CREEK	13-Apr-06	MLM	0.3	19.5	7.2	7.7	99.6	NULL
UPPER MACHODOC CREEK	5-Jun-06	MLM	0.3	25.7	7.3	5.6	109.3	NULL
UPPER MACHODOC CREEK	2-Aug-06	MLM	0.3	31.2	7.2	6.8	418.9	NULL
UPPER MACHODOC CREEK	12-Mar-07	PMH	0.3	12	7.1	10.4	745	NULL
UPPER MACHODOC CREEK	3-May-07	PMH	0.3	21.1	7.1	7.4	1656	NULL
UPPER MACHODOC CREEK	23-Jul-07	PMH	0.3	27.7	7.4	7.7	12311	7.02
UPPER MACHODOC CREEK	25-Sep-07	PMH	0.3	24.8	7	5.6	16901	9.9
UPPER MACHODOC CREEK	29-Nov-07	PMH	0.3	9	7.5	10.3	14310	8.29
UPPER MACHODOC CREEK	30-Jan-08	PMH	0.3	6.1	8.4	14.8	12914	7.38
UPPER MACHODOC CREEK	24-Apr-08	PMH	0.3	20.6	6.9	5.7	2603	NULL
UPPER MACHODOC CREEK	26-Jun-08	PMH	0.3	30.2	7.1	6	3157	NULL
UPPER MACHODOC CREEK	21-Aug-08	PMH	0.3	28.1	7.3	6.4	13169	7.54
UPPER MACHODOC CREEK	30-Oct-08	PMH	0.3	10.8	7.5	9	14064	8.16
UPPER MACHODOC CREEK	9-Dec-08	PMH	0.3	4.3	7.9	12.9	15316	8.82
UPPER MACHODOC CREEK	21-Jan-09	PMH	0.3	0.5	6.6	14	9531	5.21
UPPER MACHODOC CREEK	17-Mar-09	PMH	0.3	8.9	7.4	10.9	8114	4.54
UPPER MACHODOC CREEK	14-May-09	PMH	0.3	20.8	7	5.5	3418	NULL
UPPER MACHODOC CREEK	8-Jul-09	PMH	0.3	27.5	7	6.3	6724	3.73
UPPER MACHODOC CREEK	1-Sep-09	PMH	0.3	26.4	7.6	7.8	13267	7.62
UPPER MACHODOC CREEK	23-Nov-09	PMH	0.3	11.7	7	8.2	6445	3.54
UPPER MACHODOC CREEK	28-Jan-10	PMH	0.3	6.5	6.9	11	3647	NULL
UPPER MACHODOC CREEK	25-Mar-10	PMH	0.3	14.9	7	8.8	293	NULL
UPPER MACHODOC CREEK	19-May-10	PMH	0.3	18.4	6.8	5.4	3602	NULL
UPPER MACHODOC CREEK	1-Jun-10	PMH	0.3	29	7	6	4530	2.48
UPPER MACHODOC CREEK	29-Jul-10	PMH	0.3	31.7	7.6	6.8	13842	7.99
UPPER MACHODOC CREEK	23-Sep-10	PMH	0.3	25.6	7.7	8	17888	10.55
UPPER MACHODOC CREEK	17-Nov-10	PMH	0.3	12.6	7.6	9.2	13113	7.54
UPPER MACHODOC CREEK	10-Jan-11	PMH	0.3	0.3	8	15.6	8811	4.79

Salinity; 90th percentile: 9.792

ATTACHMENT 10

April 2011 – September 2015 Effluent pH Data

DMR QA/QC

Permit #:VA0021067

Facility:Naval Support Facility, Dahlgren

Due	Parameter Description	QTY AVG	Lim Avg	QTY MAX	Lim Max	CONC MIN	Lim Min	CONC AVG	Lim Avg	CONC MAX	Lim Max
10-May-2011	pH	NULL	**********	NULL	**********	7.2	6.5	NULL	**********	7.8	8.5
10-Jun-2011	pH	NULL	**********	NULL	**********	7.4	6.5	NULL	**********	7.9	8.5
10-Jul-2011	pH	NULL	**********	NULL	**********	7.5	6.5	NULL	**********	8.3	8.5
10-Aug-2011	pH	NULL	**********	NULL	**********	7.1	6.5	NULL	**********	8.6	8.5
10-Sep-2011	pH	NULL	**********	NULL	**********	7.8	6.5	NULL	**********	8.4	8.5
10-Oct-2011	pH	NULL	**********	NULL	**********	7.1	6.5	NULL	**********	7.9	8.5
10-Nov-2011	pH	NULL	**********	NULL	**********	7.1	6.5	NULL	**********	8	8.5
10-Dec-2011	pH	NULL	**********	NULL	**********	7.1	6.5	NULL	**********	7.8	8.5
10-Jan-2012	pH	NULL	**********	NULL	**********	6.7	6.5	NULL	**********	7.3	8.5
10-Feb-2012	pH	NULL	**********	NULL	**********	6.9	6.5	NULL	**********	7.5	8.5
10-Mar-2012	pH	NULL	**********	NULL	**********	7.2	6.5	NULL	**********	7.7	8.5
10-Apr-2012	pH	NULL	**********	NULL	**********	7.2	6.5	NULL	**********	7.6	8.5
10-May-2012	pH	NULL	**********	NULL	**********	7.4	6.5	NULL	**********	7.9	8.5
10-Jun-2012	pH	NULL	**********	NULL	**********	7.3	6.5	NULL	**********	7.8	8.5
10-Jul-2012	pH	NULL	**********	NULL	**********	7.4	6.5	NULL	**********	8	8.5
10-Aug-2012	pH	NULL	**********	NULL	**********	7.4	6.5	NULL	**********	8.2	8.5
10-Sep-2012	pH	NULL	**********	NULL	**********	7.1	6.5	NULL	**********	8	8.5
10-Oct-2012	pH	NULL	**********	NULL	**********	7.3	6.5	NULL	**********	7.8	8.5
10-Nov-2012	pH	NULL	**********	NULL	**********	6.6	6.5	NULL	**********	8	8.5
10-Dec-2012	pH	NULL	**********	NULL	**********	6.9	6.5	NULL	**********	7.5	8.5
10-Jan-2013	pH	NULL	**********	NULL	**********	6.7	6.5	NULL	**********	7.7	8.5
10-Feb-2013	pH	NULL	**********	NULL	**********	7	6.5	NULL	**********	8	8.5
10-Mar-2013	pH	NULL	**********	NULL	**********	7.4	6.5	NULL	**********	7.8	8.5
10-Apr-2013	pH	NULL	**********	NULL	**********	7.1	6.5	NULL	**********	7.9	8.5
10-May-2013	pH	NULL	**********	NULL	**********	7.1	6.5	NULL	**********	7.5	8.5
10-Jun-2013	pH	NULL	**********	NULL	**********	7.1	6.5	NULL	**********	7.8	8.5
10-Jul-2013	pH	NULL	**********	NULL	**********	7.5	6.5	NULL	**********	7.9	8.5
10-Aug-2013	pH	NULL	**********	NULL	**********	7.6	6.5	NULL	**********	8	8.5
10-Sep-2013	pH	NULL	**********	NULL	**********	7.5	6.5	NULL	**********	7.9	8.5
10-Oct-2013	pH	NULL	**********	NULL	**********	7.5	6.5	NULL	**********	8	8.5
10-Nov-2013	pH	NULL	**********	NULL	**********	7.3	6.5	NULL	**********	7.9	8.5
10-Dec-2013	pH	NULL	**********	NULL	**********	7.3	6.5	NULL	**********	7.9	8.5
10-Jan-2014	pH	NULL	**********	NULL	**********	7.1	6.5	NULL	**********	7.5	8.5
10-Feb-2014	pH	NULL	**********	NULL	**********	7.1	6.5	NULL	**********	7.5	8.5
10-Mar-2014	pH	NULL	**********	NULL	**********	6.7	6.5	NULL	**********	7.4	8.5
10-Apr-2014	pH	NULL	**********	NULL	**********	6.9	6.5	NULL	**********	7.3	8.5
10-May-2014	pH	NULL	**********	NULL	**********	6.8	6.5	NULL	**********	7.3	8.5

10-Jun-2014	pH	NULL	**********	NULL	**********	6.72	6.5	NULL	**********	7.36	8.5
10-Jul-2014	pH	NULL	**********	NULL	**********	7	6.5	NULL	**********	7.6	8.5
10-Aug-2014	pH	NULL	**********	NULL	**********	7.4	6.5	NULL	**********	7.7	8.5
10-Sep-2014	pH	NULL	**********	NULL	**********	7.4	6.5	NULL	**********	7.9	8.5
10-Oct-2014	pH	NULL	**********	NULL	**********	7.6	6.5	NULL	**********	8.1	8.5
10-Nov-2014	pH	NULL	**********	NULL	**********	7.7	6.5	NULL	**********	8	8.5
10-Dec-2014	pH	NULL	**********	NULL	**********	7.5	6.5	NULL	**********	7.9	8.5
10-Jan-2015	pH	NULL	**********	NULL	**********	6.9	6.5	NULL	**********	7.6	8.5
10-Feb-2015	pH	NULL	**********	NULL	**********	7	6.5	NULL	**********	7.5	8.5
10-Mar-2015	pH	NULL	**********	NULL	**********	7.1	6.5	NULL	**********	7.7	8.5
10-Apr-2015	pH	NULL	**********	NULL	**********	6.7	6.5	NULL	**********	7.7	8.5
10-May-2015	pH	NULL	**********	NULL	**********	6.8	6.5	NULL	**********	7.6	8.5
10-Jun-2015	pH	NULL	**********	NULL	**********	6.8	6.5	NULL	**********	7.7	8.5
10-Jul-2015	pH	NULL	**********	NULL	**********	7	6.5	NULL	**********	7.6	8.5
10-Aug-2015	pH	NULL	**********	NULL	**********	7.1	6.5	NULL	**********	7.6	8.5
10-Sep-2015	pH	NULL	**********	NULL	**********	6.8	6.5	NULL	**********	7.7	8.5
10-Oct-2015	pH	NULL	**********	NULL	**********	6.8	6.5	NULL	**********	7.7	8.5

All reported pH data:

90th percentile: 8.0 S.U.
10th percentile: 6.9 S.U.

ATTACHMENT 11

April 2011 – September 2015 Effluent Data

DMR QA/QC

Permit #:VA0021067

Facility:Naval Support Facility, Dahlgren

Due	Parameter Description	QTY AVG	Lim Avg	QTY MAX	Lim Max	CONC MIN	Lim Min	CONC AVG	Lim Avg	CONC MAX	Lim Max
10-May-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.1	5.0	0.20	5.0
10-Jun-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.8	5.0	1.9	5.0
10-Jul-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.3	5.0	0.9	5.0
10-Aug-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.2	5.0	0.5	5.0
10-Sep-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.1	5.0	0.2	5.0
10-Oct-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.3	5.0	1.0	5.0
10-Nov-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	5.0	<QL	5.0
10-Dec-2011	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.05	5.0	0.46	5.0
10-Jan-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.04	5.0	0.08	5.0
10-Feb-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.08	5.0	0.19	5.0
10-Mar-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	5.0	<QL	5.0
10-Apr-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.03	5.0	0.12	5.0
10-May-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.04	5.0	0.02	5.0
10-Jun-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.07	5.0	0.04	5.0
10-Jul-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.02	5.0	0.08	5.0
10-Aug-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	5.0	<QL	5.0
10-Sep-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.05	5.0	0.13	5.0
10-Oct-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.04	5.0	0.17	5.0
10-Nov-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	5.0	<QL	5.0
10-Dec-2012	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.05	5.0	0.15	5.0
10-Jan-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.08	5.0	0.34	5.0
10-Feb-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.07	5.0	0.25	5.0
10-Mar-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.05	5.0	0.08	5.0
10-Apr-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.38	5.0	1.43	5.0
10-May-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	5.0	<QL	5.0
10-Jun-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	5.0	<QL	5.0
10-Jul-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	5.0	<QL	5.0
10-Aug-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	5.0	<QL	5.0
10-Sep-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	5.0	<QL	5.0
10-Oct-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	5.0	<QL	5.0
10-Nov-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	5.0	<QL	5.0
10-Dec-2013	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	5.0	<QL	5.0
10-Jan-2014	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	5.0	<QL	5.0
10-Feb-2014	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.05	5.0	0.10	5.0
10-Mar-2014	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.14	5.0	0.29	5.0
10-Apr-2014	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.03	5.0	0.11	5.0
10-May-2014	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.03	5.0	0.11	5.0

10-Jun-2014	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.02	5.0	0.20	5.0
10-Jul-2014	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	5.0	<QL	5.0
10-Aug-2014	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.06	5.0	0.25	5.0
10-Sep-2014	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	<QL	5.0	<QL	5.0
10-Oct-2014	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.00	5.0	0.00	5.0
10-Nov-2014	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.0	5.0	0.18	5.0
10-Dec-2014	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.15	5.0	1.14	5.0
10-Jan-2015	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0	5.0	0	5.0
10-Feb-2015	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0	5.0	0	5.0
10-Mar-2015	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.33	5.0	1.20	5.0
10-Apr-2015	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.0	5.0	0.0	5.0
10-May-2015	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.87	5.0	1.79	5.0
10-Jun-2015	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.00	5.0	0.00	5.0
10-Jul-2015	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.0	5.0	0.0	5.0
10-Aug-2015	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.0	5.0	0.0	5.0
10-Sep-2015	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.0	5.0	0.0	5.0
10-Oct-2015	AMMONIA, AS N	NULL	**********	NULL	**********	NULL	**********	0.02	5.0	0.11	5.0
10-May-2011	BOD5	2	82	3	120	NULL	**********	2.0	30	2.0	45
10-Jun-2011	BOD5	3	82	5	120	NULL	**********	2.4	30	4.2	45
10-Jul-2011	BOD5	8	82	73	120	NULL	**********	10.1	30	34.0	45
10-Aug-2011	BOD5	2	82	4	120	NULL	**********	2.2	30	3.9	45
10-Sep-2011	BOD5	2	82	2	120	NULL	**********	2.0	30	2.0	45
10-Oct-2011	BOD5	10.4	82	41.6	120	NULL	**********	2.3	30	9.1	45
10-Nov-2011	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Dec-2011	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Jan-2012	BOD5	0.7	82	2.9	120	NULL	**********	0.39	30	1.7	45
10-Feb-2012	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Mar-2012	BOD5	0.2	82	0.7	120	NULL	**********	0.2	30	0.8	45
10-Apr-2012	BOD5	1.5	82	0.90	120	NULL	**********	0.9	30	0.7	45
10-May-2012	BOD5	0.3	82	1.22	120	NULL	**********	0.5	30	2.2	45
10-Jun-2012	BOD5	0.5	82	1.7	120	NULL	**********	0.7	30	2.2	45
10-Jul-2012	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Aug-2012	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Sep-2012	BOD5	0.4	82	1.8	120	NULL	**********	0.5	30	2.2	45
10-Oct-2012	BOD5	0.3	82	1.4	120	NULL	**********	0.4	30	1.7	45
10-Nov-2012	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Dec-2012	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Jan-2013	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Feb-2013	BOD5	0.5	82	2.03	120	NULL	**********	0.4	30	1.9	45
10-Mar-2013	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Apr-2013	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-May-2013	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Jun-2013	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45

10-Jul-2013	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Aug-2013	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Sep-2013	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Oct-2013	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Nov-2013	BOD5	0.3	82	1.5	120	NULL	**********	0.4	30	1.5	45
10-Dec-2013	BOD5	0.4	82	1.53	120	NULL	**********	0.4	30	1.7	45
10-Jan-2014	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Feb-2014	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Mar-2014	BOD5	4.2	82	10.6	120	NULL	**********	2.1	30	6.5	45
10-Apr-2014	BOD5	2.4	82	10.45	120	NULL	**********	1.3	30	5.6	45
10-May-2014	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Jun-2014	BOD5	0.0	82	0.0	120	NULL	**********	0.0	30	0.0	45
10-Jul-2014	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Aug-2014	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Sep-2014	BOD5	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Oct-2014	BOD5	0.0	82	0.0	120	NULL	**********	0.0	30	0.0	45
10-Nov-2014	BOD5	0.0	82	0.0	120	NULL	**********	0.0	30	0.0	45
10-Dec-2014	BOD5	0.0	82	0.0	120	NULL	**********	0.0	30	0.0	45
10-Jan-2015	BOD5	0.0	82	0.0	120	NULL	**********	0.0	30	0.0	45
10-Feb-2015	BOD5	0	82	0	120	NULL	**********	0	30	0	45
10-Mar-2015	BOD5	1.1	82	3.37	120	NULL	**********	1.9	30	3.2	45
10-Apr-2015	BOD5	0.1	82	0.89	120	NULL	**********	0.2	30	0.8	45
10-May-2015	BOD5	0.5	82	2.95	120	NULL	**********	0.4	30	1.8	45
10-Jun-2015	BOD5	0.3	82	0.88	120	NULL	**********	0.6	30	1.7	45
10-Jul-2015	BOD5	0	82	0	120	NULL	**********	0	30	0	45
10-Aug-2015	BOD5	0.5	82	3.36	120	NULL	**********	0.9	30	4.2	45
10-Sep-2015	BOD5	0.1	82	0.58	120	NULL	**********	0.2	30	0.7	45
10-Oct-2015	BOD5	0.1	82	0.0	120	NULL	**********	0.4	30	1.6	45
10-Jan-2012	NITROGEN, TOTAL (AS N) (CALENDAR YEAR)	NULL	**********	NULL	**********	NULL	**********	2.86	7.0	NULL	**********
10-Jan-2013	NITROGEN, TOTAL (AS N) (CALENDAR YEAR)	NULL	**********	NULL	**********	NULL	**********	3.1	7.0	NULL	**********
10-Jan-2014	NITROGEN, TOTAL (AS N) (CALENDAR YEAR)	NULL	**********	NULL	**********	NULL	**********	1.7	7.0	NULL	**********
10-Jan-2015	NITROGEN, TOTAL (AS N) (CALENDAR YEAR)	NULL	**********	NULL	**********	NULL	**********	1.6	7.0	NULL	**********
10-Jan-2012	PHOSPHORUS, TOTAL (AS P) (CALENDAR YEAR)	NULL	**********	NULL	**********	NULL	**********	2.09	2.0	NULL	**********
10-Jan-2013	PHOSPHORUS, TOTAL (AS P) (CALENDAR YEAR)	NULL	**********	NULL	**********	NULL	**********	2.3	2.0	NULL	**********
10-Jan-2014	PHOSPHORUS, TOTAL (AS P) (CALENDAR YEAR)	NULL	**********	NULL	**********	NULL	**********	0.29	2.0	NULL	**********
10-Jan-2015	PHOSPHORUS, TOTAL (AS P) (CALENDAR YEAR)	NULL	**********	NULL	**********	NULL	**********	0.54	2.0	NULL	**********
10-May-2011	TSS	2	82	3	120	NULL	**********	1.2	30	2.0	45
10-Jun-2011	TSS	2	82	4	120	NULL	**********	2.1	30	5.0	45
10-Jul-2011	TSS	10	82	66	120	NULL	**********	11.5	30	32.3	45
10-Aug-2011	TSS	3	82	9	120	NULL	**********	2.6	30	7.0	45
10-Sep-2011	TSS	1	82	2	120	NULL	**********	1.4	30	2.0	45
10-Oct-2011	TSS	20	82	73	120	NULL	**********	4.9	30	16.0	45
10-Nov-2011	TSS	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45

10-Dec-2011	TSS	2	82	5	120	NULL	**********	0.77	30	3.0	45
10-Jan-2012	TSS	1.9	82	6.4	120	NULL	**********	1.00	30	3.0	45
10-Feb-2012	TSS	0.8	82	3.3	120	NULL	**********	0.77	30	3.0	45
10-Mar-2012	TSS	0.3	82	0.3	120	NULL	**********	0.23	30	0.3	45
10-Apr-2012	TSS	1.1	82	1.4	120	NULL	**********	1.0	30	1.7	45
10-May-2012	TSS	0.5	82	0.3	120	NULL	**********	0.7	30	0.7	45
10-Jun-2012	TSS	0.6	82	1.0	120	NULL	**********	0.6	30	1.0	45
10-Jul-2012	TSS	0.5	82	0.7	120	NULL	**********	0.7	30	1.0	45
10-Aug-2012	TSS	0.7	82	1.1	120	NULL	**********	0.9	30	1.3	45
10-Sep-2012	TSS	1.7	82	5.1	120	NULL	**********	1.7	30	4.0	45
10-Oct-2012	TSS	0.9	82	1.8	120	NULL	**********	1.3	30	2.0	45
10-Nov-2012	TSS	0.2	82	0.3	120	NULL	**********	0.3	30	0.7	45
10-Dec-2012	TSS	1.1	82	3.0	120	NULL	**********	2.2	30	5.3	45
10-Jan-2013	TSS	2.9	82	4.0	120	NULL	**********	4.3	30	6.0	45
10-Feb-2013	TSS	4.3	82	10.9	120	NULL	**********	4.0	30	9.7	45
10-Mar-2013	TSS	0.2	82	<QL	120	NULL	**********	0.2	30	<QL	45
10-Apr-2013	TSS	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-May-2013	TSS	0.4	82	1.3	120	NULL	**********	0.3	30	1.0	45
10-Jun-2013	TSS	0.6	82	2.1	120	NULL	**********	0.5	30	1.3	45
10-Jul-2013	TSS	0.7	82	1.6	120	NULL	**********	0.5	30	1.3	45
10-Aug-2013	TSS	0.4	82	0.6	120	NULL	**********	0.5	30	0.7	45
10-Sep-2013	TSS	1.6	82	4.4	120	NULL	**********	1.5	30	4.3	45
10-Oct-2013	TSS	0.2	82	0.5	120	NULL	**********	0.3	30	0.7	45
10-Nov-2013	TSS	0.9	82	3.0	120	NULL	**********	1.2	30	4.0	45
10-Dec-2013	TSS	0.4	82	1.3	120	NULL	**********	0.3	30	0.7	45
10-Jan-2014	TSS	0.6	82	1.4	120	NULL	**********	0.3	30	0.7	45
10-Feb-2014	TSS	0.1	82	0.9	120	NULL	**********	0.1	30	0.5	45
10-Mar-2014	TSS	0.4	82	1.6	120	NULL	**********	0.2	30	0.7	45
10-Apr-2014	TSS	0.2	82	0.5	120	NULL	**********	0.2	30	0.3	45
10-May-2014	TSS	0.6	82	1.0	120	NULL	**********	0.4	30	1.0	45
10-Jun-2014	TSS	0.5	82	0.6	120	NULL	**********	0.3	30	0.3	45
10-Jul-2014	TSS	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Aug-2014	TSS	0.2	82	0.8	120	NULL	**********	0.2	30	1.0	45
10-Sep-2014	TSS	<QL	82	<QL	120	NULL	**********	<QL	30	<QL	45
10-Oct-2014	TSS	0.0	82	0.0	120	NULL	**********	0.0	30	0.0	45
10-Nov-2014	TSS	0.0	82	0.0	120	NULL	**********	0.0	30	0.0	45
10-Dec-2014	TSS	0.2	82	0.0	120	NULL	**********	0.5	30	1.3	45
10-Jan-2015	TSS	0.0	82	0.3	120	NULL	**********	0.3	30	0.7	45
10-Feb-2015	TSS	0	82	0.2	120	NULL	**********	0.1	30	0.3	45
10-Mar-2015	TSS	0	82	0	120	NULL	**********	0	30	0	45
10-Apr-2015	TSS	0.2	82	0.9	120	NULL	**********	0.3	30	0.7	45
10-May-2015	TSS	0.2	82	1.1	120	NULL	**********	0.2	30	0.7	45
10-Jun-2015	TSS	0.0	82	0.0	120	NULL	**********	0.0	30	0.0	45

10-Jul-2015	TSS	0.3	82	1.0	120	NULL	**********	0.5	30	1.0	45
10-Aug-2015	TSS	0.1	82	0.7	120	NULL	**********	0.2	30	1.0	45
10-Sep-2015	TSS	0.1	82	0.2	120	NULL	**********	0.3	30	0.3	45
10-Oct-2015	TSS	0.1	82	0.0	120	NULL	**********	0.2	30	0.7	45

ATTACHMENT 12

Upgrade Design Basis
Certificate to Operate

M E M O R A N D U M

DEPARTMENT OF ENVIRONMENTAL QUALITY

Northern Regional Office

1549 Old Bridge Road, Suite 108 Woodbridge, Virginia 22192 (703) 490-8922

SUBJECT: Plans and Specifications for Sewage Treatment Plants

TO: Peter W. Schmidt, Director

FROM: Alan L. Laubscher, Regional Permits Manager, NRO

DATE: February 23, 1995

Project Name:	Upgrade Sewage Treatment Plant, Naval Surface Warfare Center, Dahlgren, Virginia, Contract No. N62477-91-C-0260, A&E Commission No. 1761A
Project Owner:	U. S. Department of the Navy, Naval Surface Warfare Center, Dahlgren Division
Project Scope:	This project involves the upgrade and expansion of Dahlgren NSWC sewage treatment plant. The project consists of the installation of a 0.72 MGD sewage treatment works consisting of bar screens, dissolved air floatation unit, raw sewage influent pumping station, biological reactors with anoxic and aerobic zones, secondary clarifiers, chemical addition, ultra-violet disinfection, backup chlorination dechlorination, and post aeration. Solids handling consists of existing anaerobic digestion. A lime feeder with belt filter press is provided as backup.
Design Basis:	This project has been designed for an average flow of 0.072 MGD. The proposed facilities have been designed to comply with effluent limits of 30 mg/l BOD5 and TSS, 6.2 mg/l for ammonia and 200 MPN/100ml for fecal coliform. The facilities are also designed to meet anticipated future limits of 2 mg/l for total phosphorus, 5 mg/l for ammonia nitrogen and 7 mg/l for total nitrogen.
Previous Agency Action:	The facility is required to take the polishing ponds at the treatment facilities off-line as soon as possible in order to meet waste management regulations.
Virginia Department of Health Action:	By letter dated January 9, 1995 the Virginia Department of Health conditionally approved the plans and specifications as noted in their letter report.
Staff Comments:	None

Attachment 7

STAFF RECOMMENDATIONS:

The staff recommends that the Director:

Conditionally approve the plans and specifications subject to the following conditions:

1. An operation and maintenance manual and biosolids management plan must be submitted to the Virginia Department of Health and this office for review and approval prior to operation of this project.

2. If the biosolids treatment and handling capacity provided by this treatment works fails to meet the state and federal technical requirements for biosolids management, a plan outlining the necessary corrective action must be submitted to this Department and the Department of Health within 60 days upon notice to the owner.

3. Ultraviolet disinfection represents new technology for which limited performance is available; therefore, one year of testing for fecal coliform bacteria shall be initiated to evaluate the performance of the UV disinfection system following start-up. A minimum sampling frequency of three (3) samples per week is recommended.

APPROVED: Dwayne L Clayton
for Director, Department of Environmental Quality

DATE: Feb 28, 1995

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

Northern Virginia Regional Office

1549 Old Bridge Road, Suite 108 Woodbridge, Virginia 22192 (703) 490-8922

SUBJECT: Plans and Specifications for Sewage Treatment Plants

TO: Peter W. Schmidt, Director

FROM: Alan L. Laubscher, Regional Permit Manager, NRO

DATE: September 22, 1995

Project Name:	Final Submission Closure of Existing Polishing Ponds and Constructed Wetlands
Project Owner:	Naval Surface Warfare Center, Dahlgren
Project Scope:	This project involves the closure of the existing polishing ponds and the installation of constructed wetlands at the existing sewage treatment plant.
Previous Agency Action:	The facility has been in compliance with its permit during the last quarter.
Virginia Department of	By letter dated August 3, 1995 the Virginia Department of Health conditionally approved the plans and specifications as noted in their letter report.
Staff Comments:	The two existing polishing ponds are being closed due to waste sludges and earth cover in the polishing ponds being classified as an EPA hazardous waste F006 (sludge from electroplating operations).

STAFF RECOMMENDATIONS:

The staff recommends that the Director:

Conditionally approve the plans and specifications subject to the following conditions:

1) This approval is contingent upon the successful completion of hazardous waste closure activities associated with the polishing ponds. The removal of all contaminants outlined in the approved hazardous waste closure plan must be completed for soils and clean closure demonstrated for groundwater, and clean closure must be acknowledged by the Department of Environmental Quality prior to proceeding with the construction of the constructed wetland. In the event the hazardous waste unit cannot be clean closed for either soils or groundwater, DEQ must be contacted in order to evaluate any options that may be available for the relocation or redesign of the wetland.

2) The media size of the constructed wetland material be increased to a stone or rock of 1/2 to 1 inch size range. Also, the 10 inch diameter sludge removal pipe in each wetland needs to be fitted with three capped observation tees of six inch or larger size spaced approximately equidistant apart.

APPROVED: Gregory L Clayton
for Director, Department of Environmental Quality

DATE: Sept 26, 1995

COMMONWEALTH of VIRGINIA

RANDOLPH L. GORDON, M.D., M.P.H.
COMMISSIONER

Department of Health
Office of Water Programs

ENVIRONMENTAL ENGINEERING FIELD OFFICE
400 S. MAIN ST. - 2ND FLOOR
CULPEPER, VA 22701
PHONE: 540-829-7340
FAX: 540-829-7337

SUBJECT: King George County
Sewerage - Dahlgren NSWC

Mr. W. E. Goss, Jr., Head
Safety Environmental Office
Dahlgren NSWC
17320 Dahlgren Road
Dahlgren, VA 22448-5100

Dear Mr. Goss:

Enclosed is the Certificate to Operate (CTO) for the Dahlgren NSWC Sewage Treatment Works.

This action is in accordance with Section 2.06 of the Virginia *Sewerage Regulations*.

If you have any questions regarding the CTO, please feel free to contact this office.

Sincerely,

Hugh J. Eggborn, P.E.
Engineering Field Director

JSD/plw
CC: DEQ - Water - Woodbridge
King George County Health Department
OWP - Central
O:\msw\king\s\dahlgrennswc-1a

Post-it™ Fax Note 7671	Date 5/21	# of pages ▶ 3
To J. DESAI	From A YOUNG	
Co./Dept. VDH	Co. DEQ	
Phone #	Phone #	
Fax #	Fax #	

VDH VIRGINIA DEPARTMENT OF HEALTH

COMMONWEALTH of VIRGINIA

RANDOLPH L. GORDON, M.D., M.P.H.
COMMISSIONER

Department of Health
Office of Water Programs

ENVIRONMENTAL ENGINEERING FIELD OFFICE
400 S. MAIN ST. - 2ND FLOOR
CULPEPER, VA 22701
PHONE: 540-829-7340
FAX: 540-829-7337

CERTIFICATE TO OPERATE

Owner: Dahlgren Naval Surface Warfare Center

Facility/System Name: Dahlgren NSWC STW

VPDES Permit Number: VA0021067

Description of the Facility/System: The project included the construction of a 0.72 MGD sewage treatment works consisting of bar screens, dissolved air flotation (DAF) unit, raw sewage influent pumping station, biological reactors with anoxic and aerobic zones, secondary clarifiers, chemical addition, ultra-violet disinfection, chlorination/dechlorination (to be utilized only when UV system is out of service) and postaeration.

Authorization to Operate: By letters dated October 30, 1997, as well as March 26, 1998, the firm of Hays, Seay, Mattern and Mattern certified that the construction was substantially completed in accordance with approved plans and specifications. A staff member from the State Health Department conducted an inspection of the above facilities on November 19, 1997. Therefore, the owner is authorized to operate these facilities with the following conditions:

1. An operation and maintenance manual and biosolids management plan must be submitted to the State Health Department and the Department of Environmental Quality for review and approval within thirty (30) days of the issuance of this Certificate to Operate (CTO).

2. All remaining punchlist items as indicated on updated list dated March 17, 1998 must be completed within thirty (30) days of the issuance of this Certificate to Operate, with the exception of constructed wetlands, which may follow a separate construction schedule tied to the closure of the polishing ponds.

CONCURRENCE

Hugh J. Eggborn, P.E., Engineering Field Director
State Department of Health

4/6/98
Date

ISSUANCE

for David A. Johnson, Chief Deputy Director
DEpartment of Environmental Quality

4/15/98
Date

O:\msw\king\s\dahlgrennswc-1aa

COMMONWEALTH of VIRGINIA

E. Anne Peterson, M.D., M.P.H.
COMMISSIONER

Department of Health
Office of Water Programs

ENVIRONMENTAL ENGINEERING FIELD OFFICE
400 S. MAIN ST. - 2ND FLOOR
CULPEPER, VA 22701
PHONE: 540-829-7340
FAX: 540-829-7337

MEMORANDUM

DATE: SEP 28 2000

TO: Dennis Treacy, Director
Department of Environmental Quality, Water Regional Office, Woodbridge

FROM: Robert J. VanLier, P.E., Engineering Field Representative
State Health Department, Division of Wastewater Engineering

SUBJECT: King George County - Sewerage - Dahlgren NSWC STW

Please find enclosed the Certificate to Operate (CTO) for the above-mentioned facility. Please process in our usual fashion.

PLEASE STAMP THIS PAGE ONLY

COMMONWEALTH of VIRGINIA

E. Anne Peterson, M.D., M.P.H.
COMMISSIONER

Department of Health
Office of Water Programs

ENVIRONMENTAL ENGINEERING FIELD OFFICE
400 S. MAIN ST. - 2ND FLOOR
CULPEPER, VA 22701
PHONE: 540-829-7340
FAX: 540-829-7337

SUBJECT: King George County
Sewerage - Dahlgren NSWC STW

Mr. Gary Vick
Dahlgren Naval Surface Weapons Center
Public Works Officer
Department of Public Works
Building 182
Dahlgren, VA 22448-5000

Dear Mr. Vick:

Enclosed is the Certificate to Operate (CTO) for the Dahlgren NSWC STW

This action is in accordance with Section 2.06 of the Virginia ***Sewerage Regulations***.

If you have any questions regarding the CTO, please feel free to contact this office.

Sincerely,

Robert J. VanLier, P.E.
Engineering Field Representative

RJV/tjb
cc: DEQ - Water Regional Office, Woodbridge
King George County Health Department
OWP - Central
O:\tb\Dist16\Dahlgren NSWC CTO ltr..doc

COMMONWEALTH of VIRGINIA

E. Anne Peterson, M.D., M.P.H.
COMMISSIONER

Department of Health
Office of Water Programs

ENVIRONMENTAL ENGINEERING FIELD OFFICE
400 S MAIN ST · 2ND FLOOR
CULPEPER, VA 22701
PHONE: 540-829-7340
FAX: 540-829-7337

CERTIFICATE TO OPERATE

Owner: Dahlgren Naval Surface Warfare Center

Facility/System Name: Dahlgren NSWC STW

VPDES Permit Number: VA0021067

Description of the Facility/System: This project involves the addition of constructed wetlands. The wetlands are intended as a final polishing process before UV disinfection and final discharge. No change in flow is involved.

Authorization to Operate: By letter dated May 10, 2000, W. Craig Hamilton, P.E. certified that the treatment works has been installed as per the approved plans and specifications for this facility. A CTO inspection was performed by VDH and the DEQ. The Owner is authorized to operate these facilities with the condition that an operation and maintenance manual will be submitted to the VDH for approval.

CONCURRENCE

Robert J. VanLier

9/27/00 Date

Robert J. VanLier, P.E., Engineering Field Representative
State Department of Health

ISSUANCE

_____ Date

Mr. Dennis Treacy, Director
Department of Environmental Quality

RJV/tjb
O:\tb\Dist16\Dalgren NSWC.doc

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703) 583-3800 Fax (703) 583-3821
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

Thomas A. Faha
Regional Director

September 1, 2010

King George County
NSWC Dahlgren Modification to STP
PTL#24989, Permit VA0021067

Mr. William Rees
Construction Manager
Public Works Department (Bldg 182)
Naval Support Facility Dahlgren
18329 Thompson Rd
Dahlgren, VA 22448-5110

Dear Mr. Rees:

In accordance with 9VAC25-790-190 of the Commonwealth of Virginia's *Sewage Collection and Treatment Regulations*, this letter transmits the Certificate to Operate (CTO) for NSWC Dahlgren Modification to STP located in King George County. The CTO is being issued based on the Application for Certificate to Operate dated August 16, 2010, and received by this office on August 17, 2010 with supplemental information received August 24, 2010.

If you have any questions about this letter or the approval process, please contact me at (703)-583-3834 or alison.thompson@deq.virginia.gov.

Respectfully,

Alison Thompson
Water Permits Technical Reviewer

cc: VPDES Permit File VA0021067
VDH District Office, attn: Environmental Health Manager
King George County Local Building Official
W. Craig Hamilton Jr, AECOM, 1315 Franklin Rd, Roanoke, VA 24016

Attachment: CTO

Department of Environmental Quality
APPLICATION for CERTIFICATE TO OPERATE
Under the Sewage Collection and Treatment Regulations 9 VAC 25-790
and/or the Water Reclamation and Reuse Regulation 9 VAC 25-740

See instructions. Submit 1 copy of this form and any attachments. Form will expand as you enter information.

Project Title: (as it appears on plans) Modification to Sewage Treatment Plant P.E. Seal Date on Cover: July 20, 2007 Specifications Title and Date: Same as Above	
Location of Project: Naval Support Facility Dahlgren	County/City: King George Co.
Receiving Wastewater Collection System(s): N/A	
Receiving Sewage Treatment Plant(s): N/A	
PROJECT OWNER: United States Government	**RESPONSIBLE ENGINEER**
Owner Contact Name: William Rees, Government Representative	Name: W. Craig Hamilton, Jr. PE
Title: Construction Manager	Company Name: AECOM
Address: Public Works Department (Building 182) Naval Support Facility Dahlgren 18329 Thompson Road Dahlgren, Virginia 22448-5110	Address: 1315 Franklin Road Roanoke, Virginia 24016
Phone: 540-284-1063	Phone: 540-857-3207
Email: william.rees@navy.mil	Email: craig.hamilton@aecom.com
Owner Signature and Date: 8/11/2010	

PTL NUMBER FROM CERTIFICATE TO CONSTRUCT: **22997**

Attach Copy of the original Certificate to Construct if issued prior to November 9, 2008. If applicable, provide verification of compliance with any conditions in the Certificate to Construct.

Design Flow: (a) average daily flow (MGD): 0.72 (b) peak flow (MGD): 2.4
For sewage treatment plant, water reclamation or satellite reclamation projects, provide the VPDES/VPA Permit Number: VA0021067
Is a new Discharge Monitoring Report (DMR) or other monthly monitoring report required? Yes ☐ No X
For Pump Stations, Sewage Treatment Plants, and Reclamation Systems, check Reliability Class: I X II ☐ III ☐ NA ☐

Two options are provided for the Statement of Completion, depending on whether the project is being authorized under the Sewage Collection and Treatment Regulations, the Water Reclamation and Reuse Regulations, or BOTH. Please check the appropriate box and then provide signature and seal below as indicated.

X *The following statement of completion for issuance of a Certificate to Operate under the Sewage Collection and Treatment Regulations must be signed and sealed by the responsible engineer.* (DEQ will not conduct a confirming inspection.)

"The construction of the project has been completed in accordance with the referenced plans and specifications or revised only in accordance with 9 VAC 25-790-180.B, and inspections have been performed to make this statement in accordance with Section 9 VAC 25-790-180.C.1 of the Sewage Collection and Treatment Regulations."

COMMONWEALTH OF VIRGINIA
WALTER C. HAMILTON, JR.
Lic. No. 10335
4/2/10
PROFESSIONAL ENGINEER

W. Craig Hamilton, Jr.
Licensed Engineer's Signature and original seal (signed and dated)

☐ *The following statement of completion for issuance of a Certificate to Operate under the Water Reclamation and Reuse Regulation must be signed and sealed by the responsible engineer.* (DEQ will not conduct a confirming inspection.)

"The construction of the project has been completed in accordance with the referenced plans and specifications or revised only in accordance with 9 VAC 25-740-120-B.2.b. and inspections have been performed to make this statement in accordance with Section 9 VAC 25-40-120.B.3.a. of the Water Reclamation and Reuse Regulations."

Licensed Engineer's Signature and original seal (signed and dated)

For DEQ use only:

In accordance with *Code of Virginia* 1950, as amended, Title 62.1, Section 62.1-44.19, this form, signed by the appropriate DEQ representative, serves as the **Certificate to Operate** for the referenced project.

Alison Thompson		9/1/10	24989
Name	Signature	Date	CTO PTL Number

Department of Environmental Quality Authorized Representative

An Operation and Maintenance Manual must be submitted to the DEQ Regional Office in accordance with 9 VAC 25-790 for sewage treatment plants, 9 VAC 25-740 for water reclamation systems and satellite reclamation systems and VPDES or VPA permit requirements.

For pump stations, an Operation and Maintenance Manual must be maintained for the facility in accordance with 9 VAC 25-790, but is NOT to be submitted to DEQ. The pump station must be operated and maintained in accordance with that manual.

ATTACHMENT 13

Water Quality-Based Ammonia Limitation Derivation

10/29/2015 10:46:27 AM

Facility = Naval Support Facility Dahlgren WWTP
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 35.5
WLAc = 10.7
Q.L. = 0.1
# samples/mo. = 85
# samples/wk. = 21

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 21.5890699995545
Average Weekly limit = 11.2416612656529
Average Monthly LImit = 9.95795874790421

The data are:

9

ATTACHMENT 14

Whole Effluent Toxicity Test Result Summaries

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Northern Regional Office
13901 Crown Court **Woodbridge, VA 22192** **(703) 583-3800**

SUBJECT: TOXICS MANAGEMENT PROGRAM (TMP) DATA REVIEW
Naval Surface Warfare Center - Dahlgren (VA0021067)
REVIEWER: Douglas Frasier
DATE: 14 January 2015

PREVIOUS REVIEW: 5 March 2014

DATA REVIEWED:

This review covers the third (3rd) annual chronic toxicity tests conducted in November 2014 at Outfall 001.

DISCUSSION:

The results of these toxicity tests, along with the results of previous toxicity tests performed on effluent samples collected from Outfall 001 are summarized in Table 1.

The chronic toxicity of the effluent samples was determined with a 7-day static renewal survival, growth and fecundity chronic test using *M. bahia* and a 7-day static renewal survival and growth chronic test using *C. variegates*.

The chronic tests yielded for both species a No Observed Effect Concentration (NOEC) of 100% effluent; thus, passing the chronic toxicity criteria.

CONCLUSION:

The chronic toxicity tests are valid and the results are acceptable. The test results indicate that the effluent samples from Outfall 001 exhibited no chronic toxicity to the test species *M. bahia* or *C. variegates*.

BIOMONITORING RESULTS
Naval Surface Warfare Center – Dahlgren (VA0021067)

Table 1
Summary of Toxicity Test Results for Outfall 001

TEST DATE	TEST TYPE/ORGANISM	IC_{25} (%)	48-h LC_{50} (%)	NOEC (%)	% SURV	REMARKS
02/09/95	Acute *M. bahia*		28.7		0	
02/09/95	Acute *C. variegatus*		>100		75	
02/07/95	Chronic *M. bahia*			10 G	0	
02/07/95	Chronic *C. variegatus*			30 SG	18	
04/27/95	Acute *M. bahia*		31.9		0	
04/27/95	Acute *C. variegatus*		>100		100	
04/25/95	Chronic *M. bahia*			10 G	0	
04/25/95	Chronic *C. variegatus*			30 G	78	
TMP monitoring commences 6 months after CTO 4/15/98						
9/24/98	Acute *M. bahia*		>100		100	1st Quarterly
9/24/98	Acute *C. variegatus*		>100		100	
9/22/98	Chronic *M. bahia*			100 SGF	93	
9/22/98	Chronic *C. variegatus*			100 SG	100	
12/17/98	Acute *M. bahia*		>100		100	2nd Quarterly
12/17/98	Acute *C. variegatus*		>100		100	
12/15/98	Chronic *M. bahia*			100 SGF	95	
12/15/98	Chronic *C. variegatus*			100 SG	100	
3/11/99	Acute *M. bahia*		>100		100	3rd Quarterly
3/11/99	Acute *C. variegatus*		>100		100	
3/9/99	Chronic *M. bahia*			100 SG 10 F	98	
3/9/99	Chronic *C. variegatus*			100 SG	100	
6/24/99	Acute *M. bahia*		94.9		45	4th Quarterly
6/24/99	Acute *C. variegatus*		>100		100	
6/22/99	Chronic *M. bahia*			10 SGF	5	
6/22/99	Chronic *C. variegatus*			100 SG	90	
10/28/99	Acute *M. bahia*		>100		95	1st annual
10/26/99	Chronic *M. bahia*			100 SGF	90	
Permit Reissued February 28, 2000						
5/25/00	Acute *M. bahia*		>100		100	1st annual
5/23/00	Chronic *M. bahia*			100 SGF	98	
5/17/01	Acute *M. bahia*		>100		100	2nd annual
5/17/01	Acute *C. variegatus*		>100		100	
5/15/01	Chronic *M. bahia*	>100	>100	100 SGF	100	
5/15/01	Chronic *C. variegatus*	>100	>100	100 SG	95	
7/20/02	Acute *M. bahia*		>100		100	3rd annual
7/16/02	Chronic *M. bahia*	>100	>100	100 SGF	100	
11/21/02	Acute *M. bahia*		>100		100	Extra test after spray of herbicide
11/19/02	Chronic *M. bahia*	>100	>100	100 SG	98	No egg produced in the control
05/07/03	Acute *M. bahia*		>100		100	4th annual
05/06/03	Chronic *M. bahia*	>100	>100	100 SG	100	

TEST DATE	TEST TYPE/ORGANISM	IC_{25} (%)	48-h LC_{50} (%)	NOEC (%)	% SURV	REMARKS
05/12/04	Acute *M. bahia*		>100		100	5th annual
05/11/04	Chronic *M. bahia*	>100G 56.4 F	>100	100 SGF	90	
Permit Reissued 31 May 2005						
09/27/05	Chronic *M. bahia*	>100	>100	100 SGF	100	1st annual
09/27/05	Chronic *C. variegatus*	>100	>100	100 SG	100	
10/17/06	Chronic *M. bahia*	>100	>100	100 SGF	100	2nd annual
10/17/06	Chronic *C. variegatus*	>100	>100	100 SG	100	
9/18/07	Chronic *M. bahia*	>100	>100	100 SGF	100	3rd annual
9/18/07	Chronic *C. variegatus*	>100	>100	100 SG	100	
11/18/08	Chronic *M. bahia*	>100	>100	100 SGF	85	4th annual
11/18/08	Chronic *C. variegatus*	>100	>100	93 SG	93	
09/22/09	Chronic *M. bahia*	>100	>100	100 SGF	90	5th annual
09/22/09	Chronic *C. variegatus*	>100	>100	100 SG	98	
Permit Reissued 15 March 2011						
11/29/11	Chronic *M. bahia*	>100	>100	100 SGF	83	Extra – outside compliance period
11/29/11	Chronic *C. variegatus*	>100	>100	100 SG	100	
12/12/12	Chronic *M. bahia*	>100	>100	100 SGF	100	1st annual
12/12/12	Chronic *C. variegatus*	>100	>100	100 SG	100	
12/10/13	Chronic *M. bahia*	>100	>100	100 SGF	93	2nd annual
12/10/13	Chronic *C. variegatus*	>100	>100	100 SG	100	
11/18/14	Chronic *M. bahia*	>100	>100	100 SGF	90	3rd annual
11/18/14	Chronic *C. variegatus*	>100	>100	100 SG	100	

ABBREVIATIONS:

S – Survival; G – Growth; F – Fecundity

% SURV – Percent survival in 100% effluent

ATTACHMENT 15

Statistical Analysis of Previous WET Results

10/29/2015 4:09:20 PM

Facility = Naval Support Facility Dahlgren WWTP
Chemical = M. bahia
Chronic averaging period = 4
WLAa = 3
WLAc = 20
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 9
Expected Value = 1
Variance = .36
C.V. = 0.6
97th percentile daily values = 2.43341
97th percentile 4 day average = 1.66379
97th percentile 30 day average= 1.20605
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1
1
1
1
1
1
1
1
1

10/29/2015 4:09:39 PM

Facility = Naval Support Facility Dahlgren WWTP
Chemical = C. variegatus
Chronic averaging period = 4
WLAa = 3
WLAc = 20
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 9
Expected Value = 1
Variance = .36
C.V. = 0.6
97th percentile daily values = 2.43341
97th percentile 4 day average = 1.66379
97th percentile 30 day average= 1.20605
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1
1
1
1
1
1
1
1
1

ATTACHMENT 16

Calculated Compliance Endpoints
for
WET Requirements

Spreadsheet for determination of WET test endpoints or WET limits

Excel 97
Revision Date: 12/13/13
File: WETLIM10.xls
(MIX.EXE required also)

Enter data in the cells with blue type:

Entry Date:	10/29/15
Facility Name:	NSF Dahlgren WWTP
VPDES Number:	VA0021067
Outfall Number:	1
Plant Flow:	0.72 MGD
Acute 1Q10:	0 MGD
Chronic 7Q10:	0 MGD

Acute Endpoint/Permit Limit — **Use as LC_{50} in Special Condition, as TUa on DMR**

ACUTE	2.92514937	TUa	LC_{50} =	35	% Use as	2.85	TUa
ACUTE WLAa	3		Note: Inform the permittee that if the mean of the data exceeds this TUa:	1.0	a limit may result using STATS.EXE		

Chronic Endpoint/Permit Limit — **Use as NOEC in Special Condition, as TUc on DMR**

CHRONIC	29.2514937	TU_c	NOEC =	4	% Use as	25.00	TU_c
BOTH*	30.0000007	TU_c	NOEC =	4	% Use as	25.00	TU_c
AML	29.2514937	TU_c	NOEC =	4	% Use as	25.00	TU_c

ACUTE WLAa,c	30	Note: Inform the permittee that if the mean of the data exceeds this TUc:	12.0207454
CHRONIC WLAc	20	a limit may result using STATS.EXE	

* Both means acute expressed as chronic

% Flow to be used from MIX.EXE

100	%	Acute
100	%	Chronic

Diffuser /modeling study?

Enter Y/N	Y	
Acute	10	:1
Chronic	20	:1

Are data available to calculate CV? (Y/N)	N	(Minimum of 10 data points, same species, needed) — Go to Page 2
Are data available to calculate ACR? (Y/N)	N	(NOEC<LC50, do not use greater/less than data) — Go to Page 3

IWC_a	10	%	Plant flow/plant flow + 1Q10
IWC_c	5	%	Plant flow/plant flow + 7Q10

NOTE: If the IWCa is >33%, specify the NOAEC = 100% test/endpoint for use

Dilution, acute	10	100/IWCa
Dilution, chronic	20	100/IWCc

WLA_a	3	Instream criterion (0.3 TUa) X's Dilution, acute
WLA_c	20	Instream criterion (1.0 TUc) X's Dilution, chronic
$WLA_{a,c}$	30	ACR X's WLA_a - converts acute WLA to chronic units

ACR -acute/chronic ratio	10	LC50/NOEC (Default is 10 - if data are available, use tables Page 3)
CV-Coefficient of variation	0.6	Default of 0.6 - if data are available, use tables Page 2)
Constants eA	0.4109447	Default = 0.41
eB	0.6010373	Default = 0.60
eC	2.4334175	Default = 2.43
eD	2.4334175	Default = 2.43 (1 samp)

No. of sample: 1

**The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTAa,c and MDL using it are driven by the ACR.

$LTA_{a,c}$	12.328341	WLAa,c X's eA			
LTA_c	12.020746	WLAc X's eB			
MDL** with $LTA_{a,c}$	30.00000074	TU_c	NOEC =	3.333333	(Protects from acute/chronic toxicity)
MDL** with LTA_c	29.25149368	TU_c	NOEC =	3.418629	(Protects from chronic toxicity)
AML with lowest LTA	29.25149368	TU_c	NOEC =	3.418629	Lowest LTA X's eD

Rounded NOEC's					%
NOEC =	4	%			
NOEC =	4	%			
NOEC =	4				

IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU_c to TU_a

Rounded LC50's					%
LC50 =	34	%			
LC50 =	35				

MDL with $LTA_{a,c}$	3.000000074	TU_a	LC50 =	33.333333	%	LC50 = 34 %
MDL with LTA_c	2.925149368	TU_a	LC50 =	34.186288	%	LC50 = 35

Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)

IF YOU HAVE AT LEAST 10 DATA POINTS THAT ARE QUANTIFIABLE (NOT "<" OR ">") FOR A SPECIES, ENTER THE DATA IN EITHER COLUMN "G" (VERTEBRATE) OR COLUMN "J" (INVERTEBRATE). THE 'CV' WILL BE PICKED UP FOR THE CALCULATIONS BELOW. THE DEFAULT VALUES FOR eA, eB, AND eC WILL CHANGE IF THE 'CV' IS ANYTHING OTHER THAN 0.6.

Coefficient of Variation for effluent tests

CV = 0.6 (Default 0.6)

δ^2 = 0.3074847

δ = 0.554513029

Using the log variance to develop eA
(P. 100, step 2a of TSD)

Z = 1.881 (97% probability stat from table

A = -0.88929666

eA = 0.410944686

Using the log variance to develop eB
(P. 100, step 2b of TSD)

δ_4^2 = 0.086177696

δ_4 = 0.293560379

B = -0.50909823

eB = 0.601037335

Using the log variance to develop eC
(P. 100, step 4a of TSD)

δ^2 = 0.3074847

δ = 0.554513029

C = 0.889296658

eC = 2.433417525

Using the log variance to develop eD
(P. 100, step 4b of TSD)

n = 1 This number will most likely stay as "1", for 1 sample/month.

δ_n^2 = 0.3074847

δ_n = 0.554513029

D = 0.889296658

eD = 2.433417525

	Vertebrate LC_{50} Data	LN of data		Invertebrate LC_{50} Data	LN of data
	**********			**********	
1			1		
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		
16			16		
17			17		
18			18		
19			19		
20			20		
St Dev	NEED DATA	NEED DATA	St Dev	NEED DATA	NEED DATA
Mean	0	0	Mean	0	0
Variance	0	0.000000	Variance	0	0.000000
CV	0		CV	0	

Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)

To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results, acute and chronic, tested at the same temperature, same species. The chronic NOEC must be less than the acute LC_{50}, since the ACR divides the LC_{50} by the NOEC. LC_{50}'s >100% should not be used.

Table 1. ACR using Vertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data:			0

Table 1. Result:	Vertebrate ACR	0
Table 2. Result:	Invertebrate ACR	0
	Lowest ACR	Default to 10

Table 2. ACR using Invertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data:			0

DILUTION SERIES TO RECOMMEND

Table 4.

	Monitoring		Limit	
	% Effluent	TUc	% Effluent	TUc
Dilution series based on data mean	8.3	12.02075		
Dilution series to use for limit			4	25
Dilution factor to recommend:	0.2884259		0.2	
Dilution series to recommend:	100.0	1.00	100.0	1.00
	28.8	3.47	20.0	5.00
	8.3	12.02	4.0	25.00
	2.4	41.68	0.8	125.00
	0.69	144.50	0.2	625.00
Extra dilutions if needed	0.20	500.99	0.0	3125.00
	0.06	1736.98	0.0	15625.00

Convert LC_{50}'s and NOEC's to Chronic TU's for use in WLA.EXE

Table 3. **ACR used: 10**

	Enter LC_{50}	TUc	Enter NOEC	TUc
1		NO DATA		NO DATA
2		NO DATA		NO DATA
3		NO DATA		NO DATA
4		NO DATA		NO DATA
5		NO DATA		NO DATA
6		NO DATA		NO DATA
7		NO DATA		NO DATA
8		NO DATA		NO DATA
9		NO DATA		NO DATA
10		NO DATA		NO DATA
11		NO DATA		NO DATA
12		NO DATA		NO DATA
13		NO DATA		NO DATA
14		NO DATA		NO DATA
15		NO DATA		NO DATA
16		NO DATA		NO DATA
17		NO DATA		NO DATA
18		NO DATA		NO DATA
19		NO DATA		NO DATA
20		NO DATA		NO DATA

If WLA.EXE determines that an acute limit is needed, you need to convert the TUc answer you get to TUa and then an LC50, enter it here: NO DATA $\%LC_{50}$

NO DATA TUa

Cell: I9
Comment:
This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: K18
Comment: This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: J22
Comment: Remember to change the "N" to "Y" if you have ratios entered, otherwise, they won't be used in the calculations.

Cell: C40
Comment:
If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10", make sure you have selected "Y" in cell E21

Cell: C41
Comment: If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "0.6", make sure you have selected "Y" in cell E20

Cell: L48
Comment:
See Row 151 for the appropriate dilution series to use for these NOEC's

Cell: G62
Comment:
Vertebrates are:
Pimephales promelas
Oncorhynchus mykiss
Cyprinodon variegatus

Cell: J62
Comment:
Invertebrates are:
Ceriodaphnia dubia
Mysidopsis bahia

Cell: C117
Comment: Vertebrates are:

Pimephales prometas
Cyprinodon variegatus

Cell: M119
Comment: The ACR has been picked up from cell C34 on Page 1. If you have paired data to calculate an ACR, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1. Otherwise, the default of 10 will be used to convert your acute data.

Cell: M121
Comment: If you are only concerned with acute data, you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TUa. The calculation is the same: 100/NOEC = TUc or 100/LC50 = TUa.

Cell: C138
Comment: Invertebrates are:

Ceriodaphnia dubia
Mysidopsis bahia

ATTACHMENT 17

Public Notice

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in King George County, Virginia.

PUBLIC COMMENT PERIOD: February 12, 2016 to March 14, 2016

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board.

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Naval Support Activity South Potomac
18329 Thompson Road, Dahlgren, VA 22448-5018
VA0021067

PROJECT DESCRIPTION: Naval Support Activity South Potomac has applied for a reissuance of a permit for the federal Naval Support Facility Dahlgren Wastewater Treatment Plant. The applicant proposes to release treated sewage wastewaters from facility operations and residences at a rate of 0.72 million gallons per day into a water body. Sludge from the treatment process will be disposed via the King George County Landfill. The facility proposes to release the treated sewage in the Upper Machodoc Creek in King George County in the Potomac River watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, biochemical oxygen demand, total suspended solids, dissolved oxygen, ammonia, enterococci, total nitrogen and total phosphorus. The facility will also be required to monitor and report flow, total Kjeldahl nitrogen, nitrate+nitrite and whole effluent toxicity.

This facility is subject to the requirements of 9VAC25-820 and has registered for coverage under the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by hand-delivery, email, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the draft permit and application at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.

Name: Douglas Frasier
Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193
Phone: (703) 583-3873 Email: Douglas.Frasier@deq.virginia.gov

ATTACHMENT 18

State/Federal Agency Comments

Frasier, Douglas (DEQ)

From: Curt Dalton -MDE- [curt.dalton@maryland.gov]
Sent: Tuesday, February 23, 2016 3:24 PM
To: Frasier, Douglas (DEQ)
Cc: Yen-Der Cheng -MDE-; Kathy Brohawn -MDE-
Subject: Re: Naval Support Facility Dahlgren WWTP - VA0021067

Mr. Frasier,

Thank you for the opportunity to review and comment the draft Naval Support Facility Dahlgren WWTP discharge permit. MDE has the following comment on the draft.

Maryland 's bacteria limits for protecting waters capable of propagating shellfish is a fecal coliform value of 14 mpn/100 ml for the protection of human health associated with shellfish consumption. The draft permit has EPA's recreational criteria of a geometric mean of 35 for enterococci which is protective of human health associated with water contact recreation.

MDE recommends that the proposed permit bacteria limit should be the same as Maryland's fecal coliform limit of 14 mpn/100 ml in this case since the Upper Machodoc Creek is also protected for the propagating of shellfish similar to the protection for the Potomac River which is within 800 feet of the discharge point.

Curtis H. Dalton, P.E., Chief
Technical Services Division
Maryland Department of the Environment
Water Management Administration
Wastewater Permits Program
1800 Washington Boulevard, STE 455
Baltimore, MD 21230-1708

curt.dalton@maryland.gov
Phone: (410) 537-3675
FAX: (410) 537-3163

On Wed, Feb 10, 2016 at 4:34 PM, Frasier, Douglas (DEQ) <Douglas.Frasier@deq.virginia.gov> wrote:

Mr. Dalton,

Attached, you will find the Public Notice for the referenced facility's permit reissuance. The 30-day comment period begins Thursday, 12 February 2016 and ends on 14 March 2016.

I have posted the Fact Sheet, supporting documentation and Draft permit at the following address for your convenience:

http://www.deq.virginia.gov/fileshare/wps/PERMIT/NRO/Naval%20Support%20Facility%20Dahlgren%20(VA0021067)/

Should you have any questions, please do not hesitate.

Best regards,

Douglas Frasier
VPDES / VPA Permit Writer, Senior II
Certified Nutrient Management Planner - Ag / Turf
Regional Toxics Management Program Coordinator
Department of Environmental Quality
Northern Regional Office
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